Rubber Journal and International Plastics

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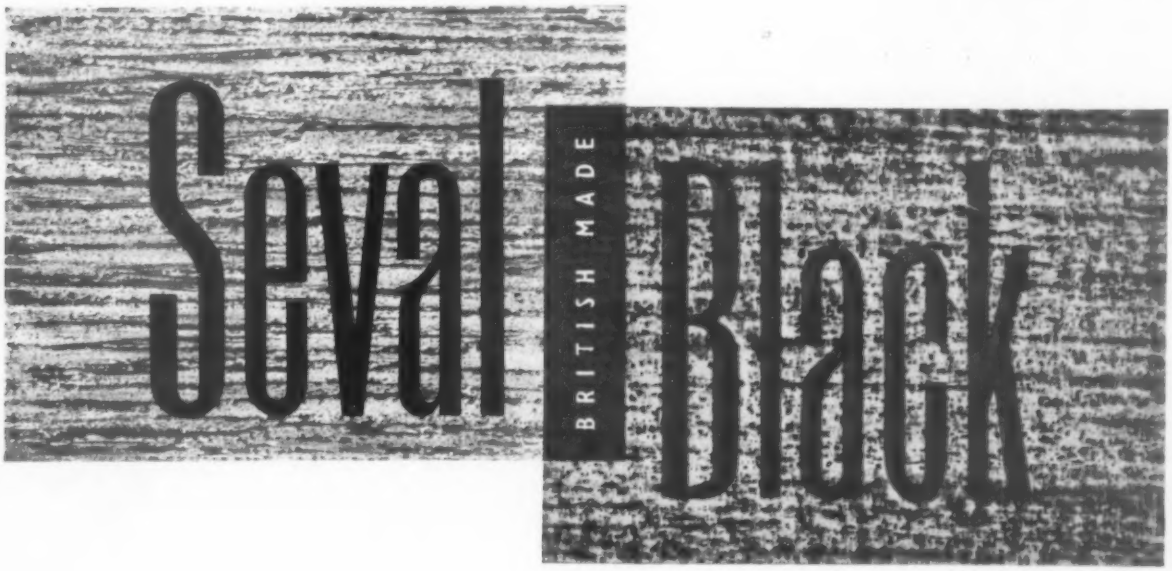

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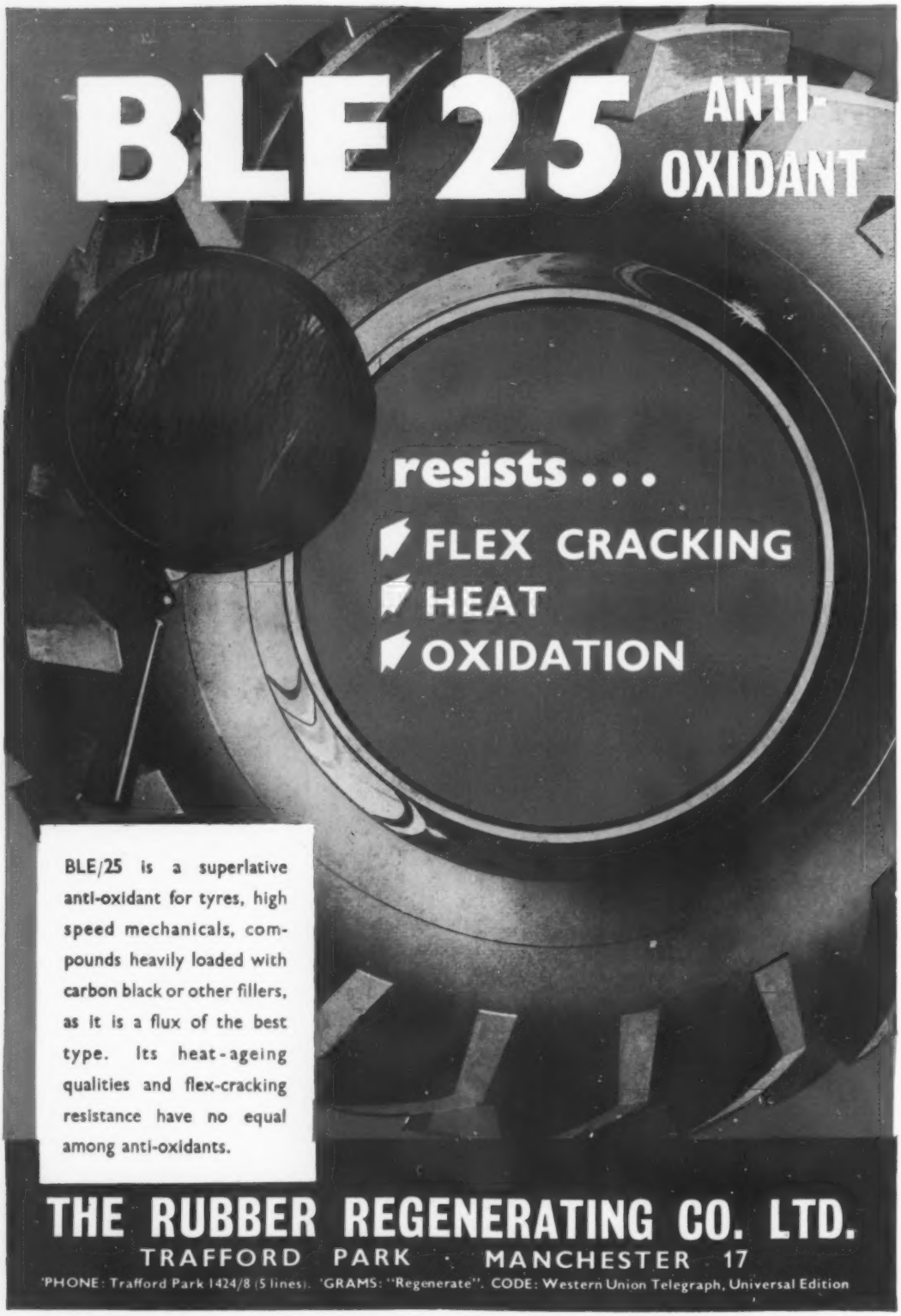
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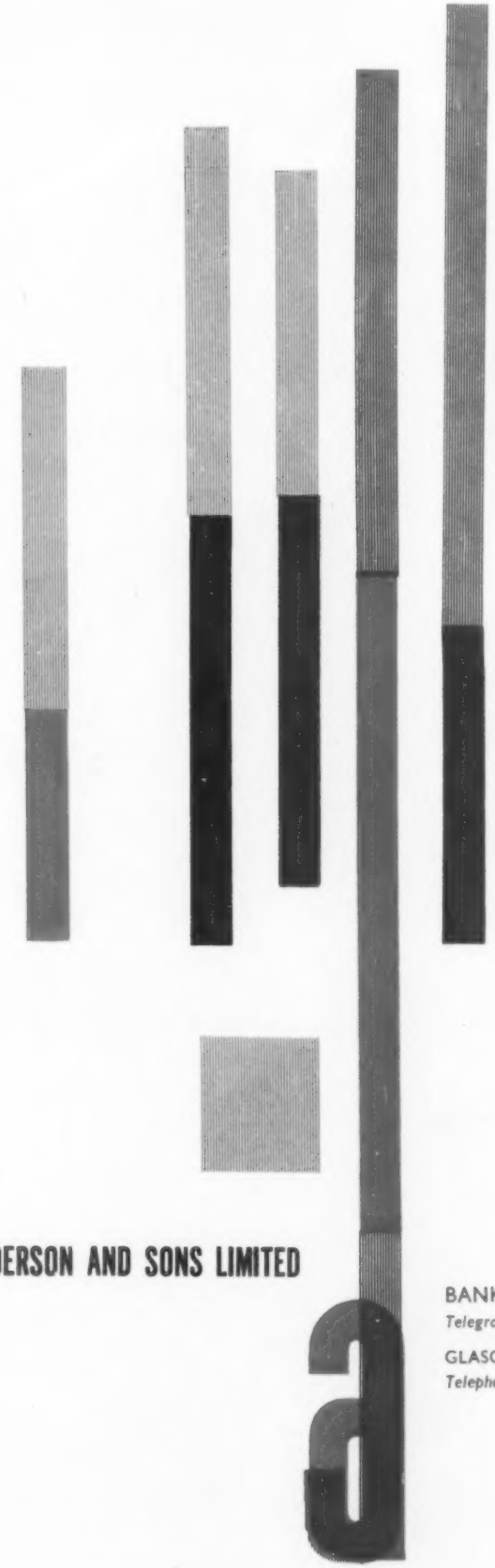

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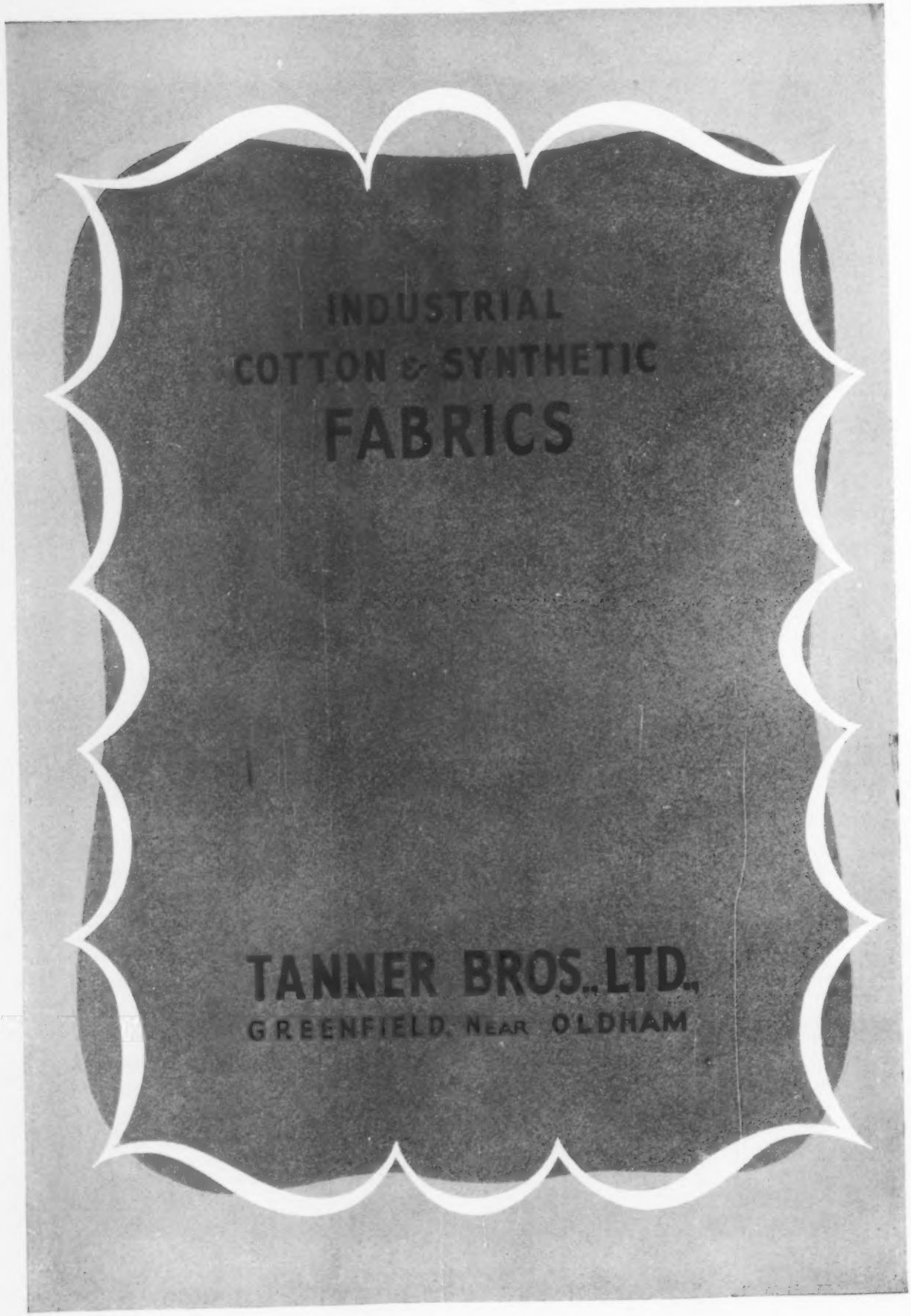
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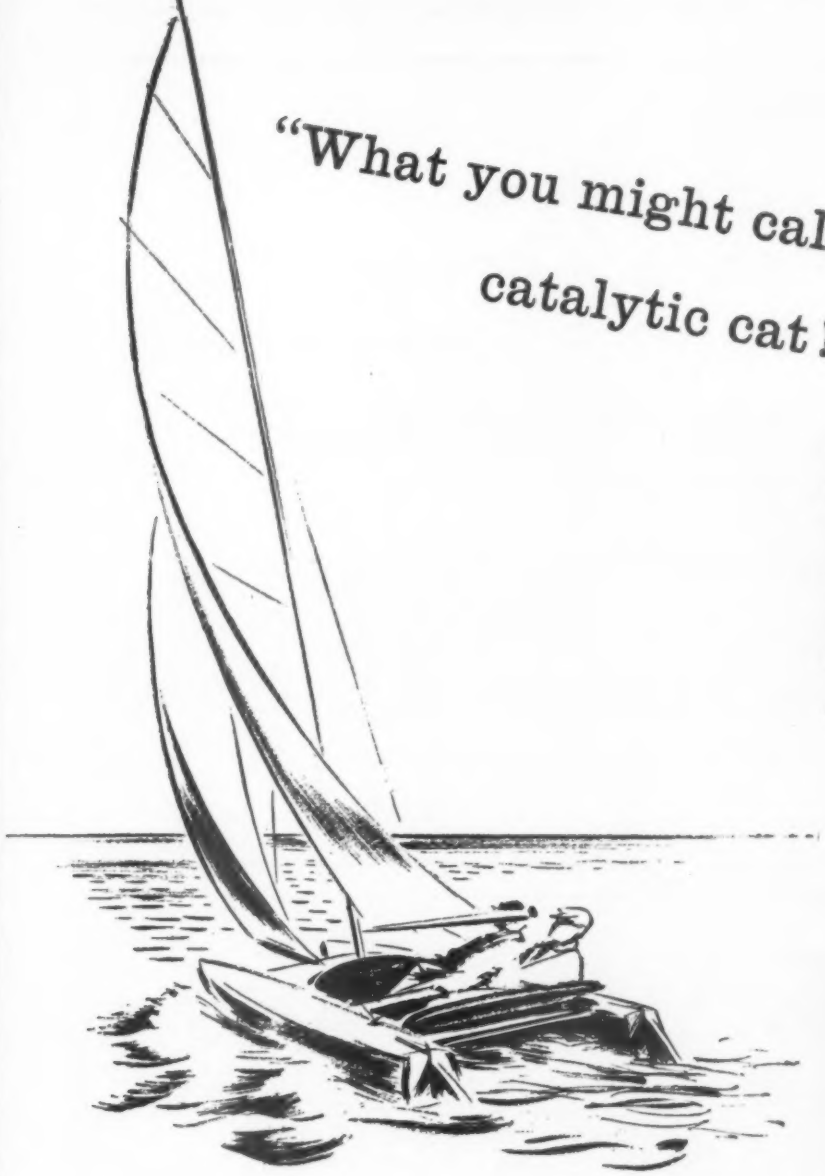

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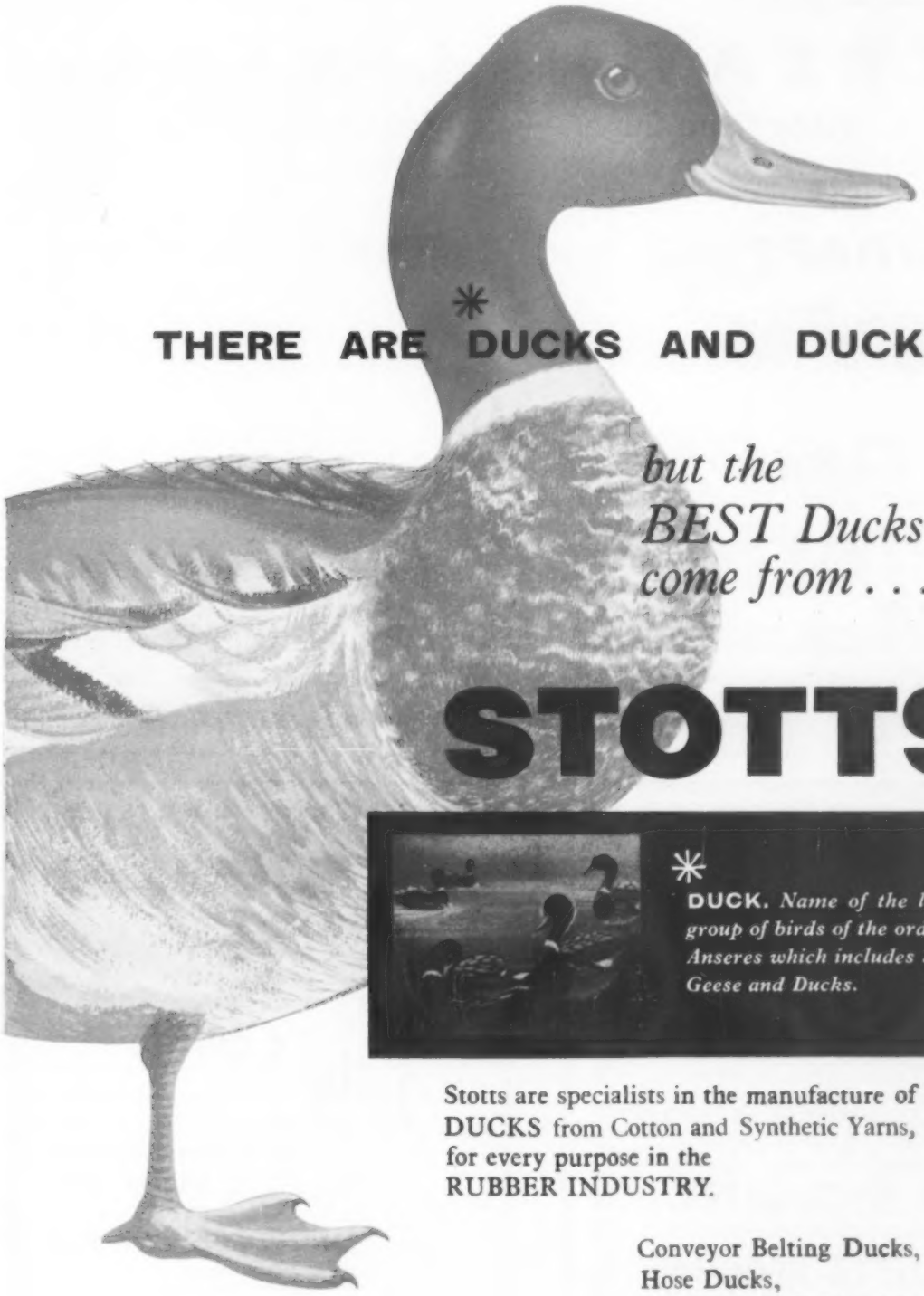

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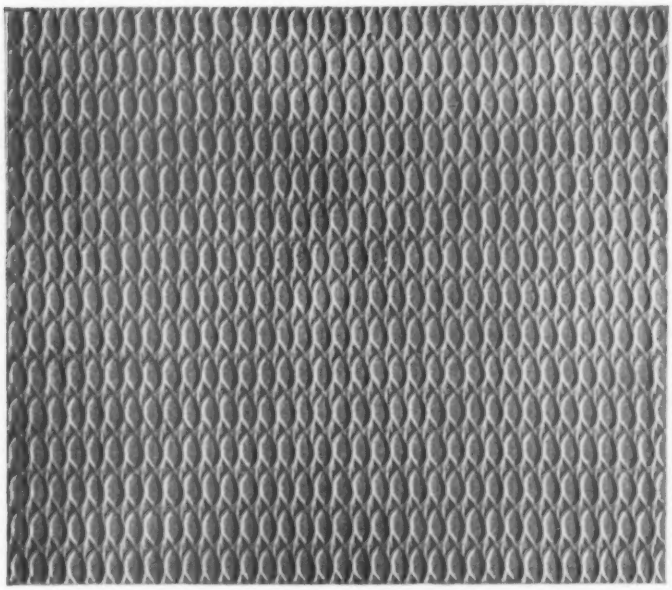

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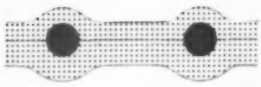

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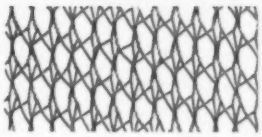

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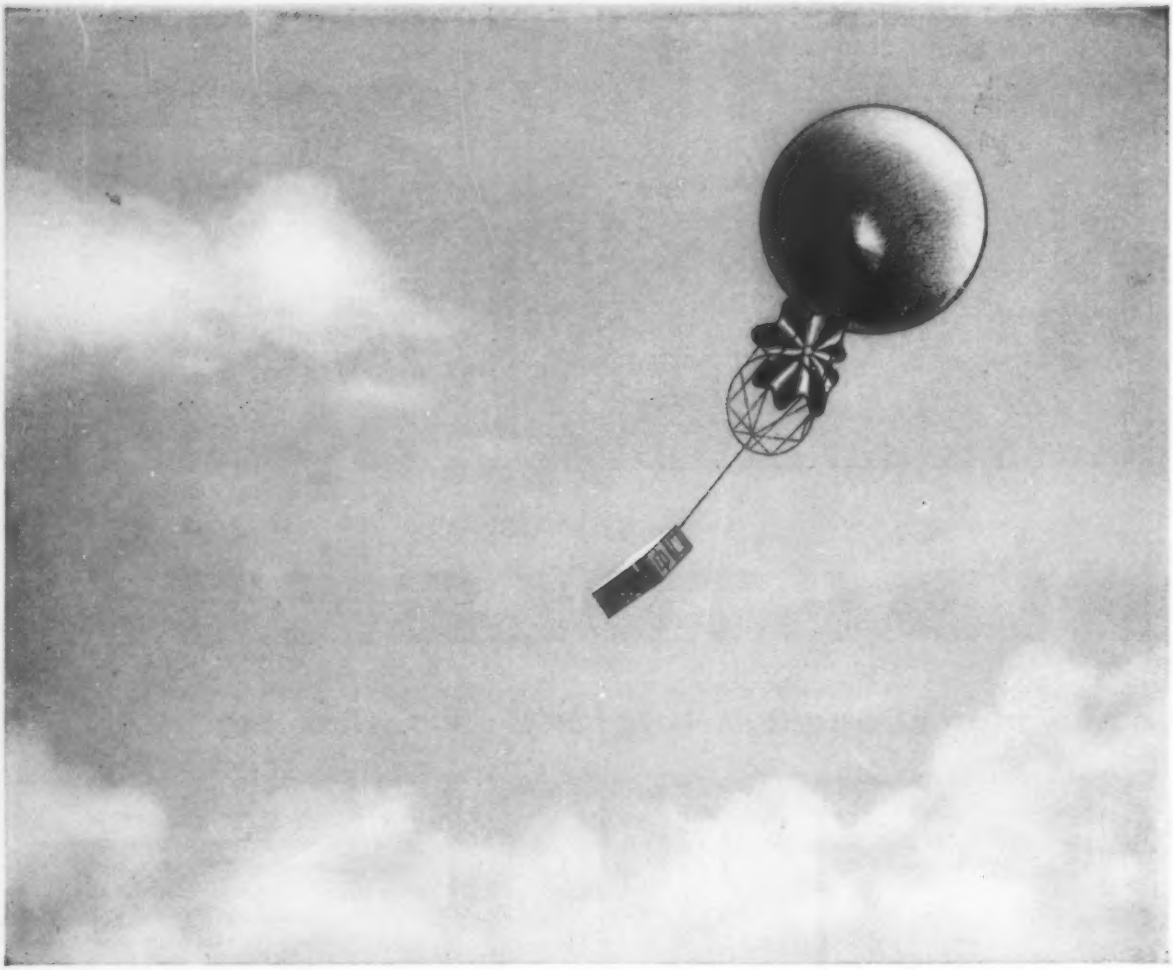

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IN ITS 77th YEAR

September 3 1960

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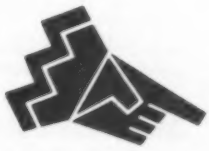

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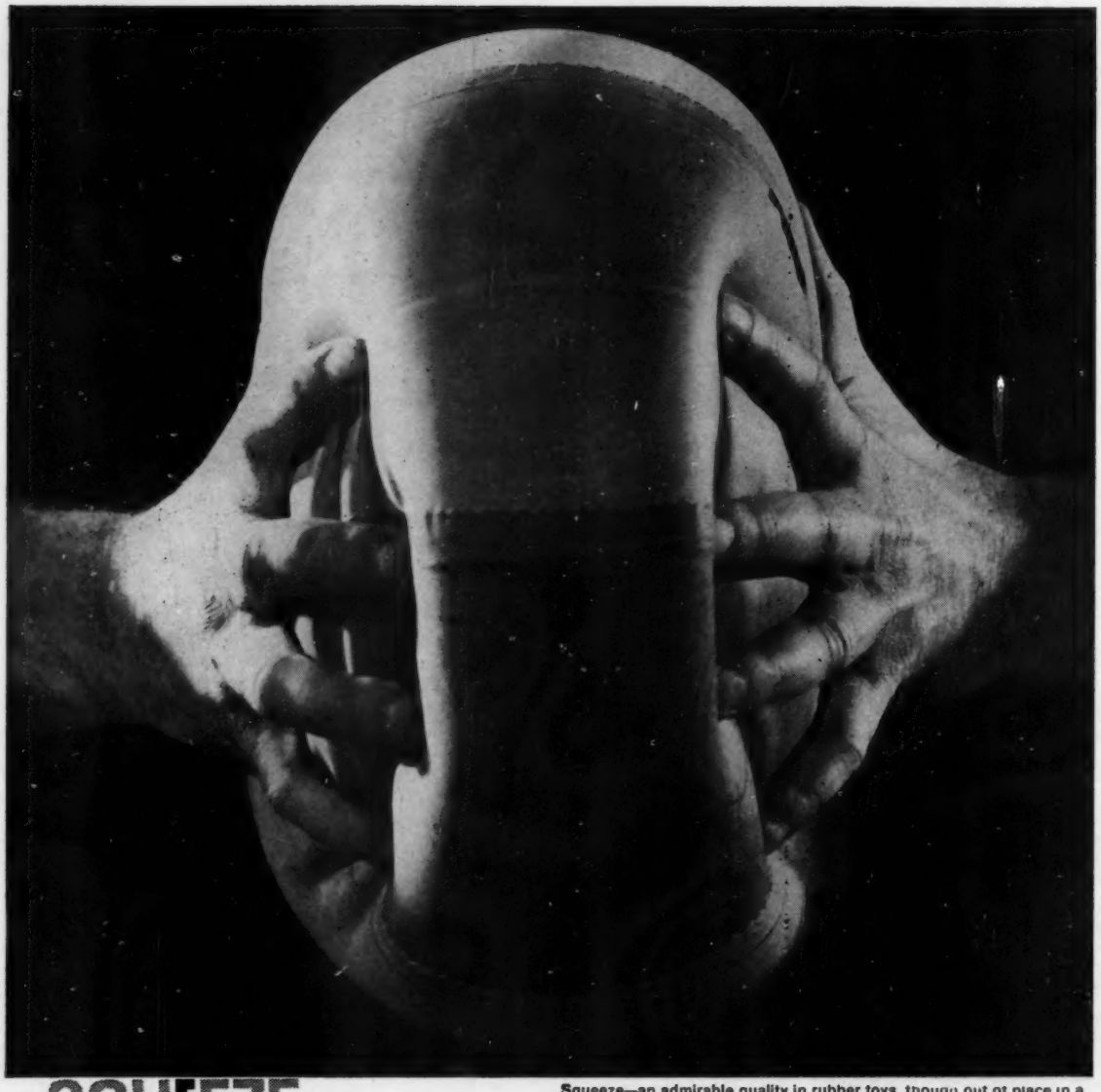

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NOTES of the WEEK

A Slice for Everybody

ONE of the chief problems complicating the issue of economic unity in Europe, so far as the UK is concerned, is how to reconcile our system of Commonwealth trade with UK participation in the new, fluid Western Europe. Up till now no one has been very certain what the effect on the Commonwealth would be if the Six and the Seven merged. To this extent, discussions have been discussions in the dark.

Now a good deal of light will be let in on the subject with the publication this month of a close study of the situation, which is bound to be widely quoted and brought up in any discussion.* The study considers that, if the EEC and the EFTA were to merge, it would be possible to arrange matters so that neither the principles of the common market were broken, nor Commonwealth trade seriously affected. In fact, the argument runs, in these circumstances the Commonwealth's exports in general would benefit from faster economic growth in the UK and easier access to Continental markets. It may seem surprising that everyone should benefit from a merger, the study says. 'But . . . with a more rational economic structure, Europe can produce a bigger cake. Only bad faith or bad management could prevent everybody from getting a slice.'

Well Placed

THE study's conclusion is an overall one—covering all countries and all exports. The effects of integration vary from country to country and from product to product. Natural rubber—next to wool the Commonwealth's most valuable export—has a good future predicted for it in the event of a merger, although there are a number of uncertain aspects. Europe takes at least 45% of Commonwealth rubber. An indirect effect of integration may be the even greater stimulation given to the production of synthetic rubber—but this could happen in any case.

By 1962 synthetic capacity in Europe is expected to reach 445,000 tons. By 1970 the common market capacity alone may have risen to 550,000 tons and the rest of Europe—in effect the UK—to around 250,000 tons. Estimated European demand in 1970 is 1.6 million tons, of which natural would therefore supply half. This means that the consumption of natural in 1970 will be no more than 20% higher than the 1955 figure—an increase of only 1.3% a year over the period. This low figure is not a very encouraging one for Commonwealth exporters of natural, but there is another factor which greatly improves the prospects. As statistics in *RJIP* have recorded, Indonesia, now only just the world's largest producer of natural, has shown on its production graph a rapidly slumping line over the past seven years. Political and economic conditions are such that this process is likely to continue.

With her extensive replanting and research programmes Malaya is well placed to take full advantage of this situation.

*The Commonwealth and Europe. A study sponsored by Britain in Europe Ltd. and written and published by the Economist Intelligence Unit.

Catching Up

CANADA, the only considerable Commonwealth exporter of chemicals to Europe, will be seriously affected by developments in the UK and the rest of Europe, whether integration takes place or not. European firms, particularly those in the petrochemicals field, are catching up on US and Canadian producers, who shot ahead immediately after the war. The study quotes polystyrene exports from Canada to Germany in 1958 as £1.3m, while the UK took £500,000 of styrene monomer in that year. Synthetic rubber exports to the UK, France and Germany totalled £14.2m. All three of these products are now finding smaller and smaller outlets as more new European plants come on stream and existing ones expand their capacities. Integration would merely speed this process up, however, and it does not weigh against the main conclusion that the economic problems of a United Europe, taken in conjunction with the Commonwealth, can be solved.

Ladies in Acrylonitrile

PLASTICS can be a rich subject for satire, as Dr James Taylor pointed out in his address *Chemistry is not Enough* at the British Association on Thursday. 'We travel along the M1 at 100 mph,' he said, 'in glassfibre/polyester cars reclining on PVC-upholstered seats supported by polyurethane foam . . . accompanied by our ladies clad in acrylonitrile and polythene-terephthalate . . . eating our sandwiches from polythene packs with polymethylmethacrylate dentures.' The tone of the satire says: and are we any better off? Dr Taylor replies that he cannot see why a Persian carpet means good taste, while a PVC fabric is the expression of a 'false need.'

Although this attitude is still present in the public mind, it is less prevalent that it was some years ago. Gradually people are coming to separate in their minds criticism of the material from criticism of the treatment it gets. And now plastics are getting good treatment on a number of planes: witness the 'Living With Plastics' exhibition now running in London, and the picture in this issue that shows some of the beautiful work by Arthur Fleischmann in Perspex.

NEWS *Briefs*

MARLEX PLASTICS EXPANSION—SBR CATALYST PLANT—MONSANTO'S MALEIC PLAN COMPLETE DOW IN SPANISH PETROCHEMICAL AGREEMENT

●Australia — The £A1.5m. pigments plant of Imperial Chemical Industries of Australia and New Zealand, which was to be sited at Altona has now been re-sited. The plant will go up on a 330-acre site at Werribee, near Melbourne.

●Holland — N. V. Transicol, a Netherlands subsidiary of Heyden Newport International Corp., is starting construction of a new plant to help supply the catalyst needs of Europe's sharply-growing synthetic rubber production. The catalyst, PMHP — para-menthane hydroperoxide — is used to control the polymerization rate in the production of styrene-butadiene rubber. PMHP is made from dipentene, a terpene hydrocarbon. The new facilities will be located in Geertruidenberg, at Transicol's existing plant site.

●Italy — The Ministry of Transport is selling internally by public tender from the State-owned stockpile 860 tons of natural ribbed smoked sheet rubber in bales.

●Indonesia — The Indonesian Finance Minister has announced cuts in import and export duties, according to the Antara news agency. The announcement caused rubber prices to rise sharply. Producers were demanding higher prices as exporters are now no longer liable for the 20% export levy.

●India — The Indian Government plans shortly to abolish export controls on about 70 items — including manufactures such as rubber belts — the Minister of Commerce and Industry said in New Delhi on August 29.

●United States — Phillips Chemical Co. is adding facilities at its plant near Houston to raise production of Marlex plastics to 100 million lb. annually. Mr. T. L. Cubbage, vice-president and general manager, said the increase would be about one-third of present output.

●Spain — An agreement has been reached between Dow and Union Quimica del Norte de Espana S.A. (Unquinesa), one of the foremost Spanish manufacturers of organic and inorganic chemicals and plastics, with headquarters in Bilbao, to construct a petrochemical complex in Spain. Dow will provide both financial and technical assistance. An approval for the joint venture has been already secured from the Spanish Government, in competition with a number of other ventures (*RJIP* May 28, 794). The complex will include a cracking unit which will produce ethylene and propylene. The resulting C4 fraction will be further processed to recover butadiene. Off-gas will be used in Unquinesa's existing methanol plant, substituting for gasified carbon materials. From these raw materials the Spanish company will manufacture a wide range of chemicals and plastics including polythene, polypropylene and polystyrene.

●Cuba — Reports from Havana that the $10m. Cuban plant of the US Rubber Co. had been 'intervened' (the local term for a Government take-over) were denied by a company spokesman in New York on August 29. Reports said the plant had been cordoned by Cuban militiamen and this was believed to be a move preceding a request for Government 'intervention.' The spokesman explained that the militiamen had cordoned the plant for many weeks as a safeguard against possible sabotage.

●Mexico — Celanese Mexicana, SA, an affiliate of the Celanese Corporation of America, has announced plans to produce nylon tyre cord. Production will start during the first quarter of 1961 with facilities for a capacity of 2,000 tons yearly. Arrangements have been made with the Firestone Tire and Rubber Co. for the process and equipment design and for continuing technical assistance, the announcement said. The new tyre cord will be produced at the Celanese plant in Toluca, Mexico, which is a strategic location for distribution of the new product to the Mexican tyre industry. A company spokesman pointed out that with the introduction of the new nylon cord, the Mexican tyre industry would be able to fill its total requirements with cords produced nationally.

●United States — Scientific Design Company has announced that it has completed Monsanto Chemical's 20,000,000lb. per year maleic anhydride expansion project at St. Louis, using the SD process. The new Monsanto unit is now on stream and operating satisfactorily. Monsanto's maleic capacity now totals 60,000,000 lb. per year, and the company is the world's largest producer.

●Australia — The American parent company of B. F. Goodrich Australia Pty. Ltd. will invest more money in Australia, according to the new managing director for Australia, Mr Russell E. Montgomery. Mr Montgomery said that the company would market Goodrich tyres in all Australian States within a month.

●Japan — Miike Gosei Chemical Industry Company Ltd., Ohmuta City, Kyushu, will build a maleic anhydride plant using the Scientific Design process of fixed-bed, catalytic air oxidation of benzene. Plant design capacity will be 8,000,000lb. of maleic anhydride per year. Scientific Design, in addition to complete process design, will help Miike Gosei in setting standards and specifications, with design of the plant and equipment, and will assist during project engineering, construction and operation. Miike Gosei is the 13th company to employ SD's maleic anhydride process, and the first plant in Japan. The new plant will bring the total capacity of SD-designed maleic anhydride plants to over 60% of the entire world's capacity.

●Thailand — The first catalytic petroleum installation of any kind in Thailand has been licensed by Houdry Process Corporation of Philadelphia to the Government. The new catalytic cracking unit will be built on the Chao Phraya River outside Bangkok, Thailand. Completion date is late 1961.

●United Kingdom — Output of man-made fibres in July was a record for any July, according to figures issued by the British Man-Made Fibres Federation. Production was 46.5 million lb., compared with 48.3 million in June and 45.2 million in July 1959.

Mulroy's cartoon is on page 344

Early Knowledge of Rubber

PART 2 — THE NAMING OF LATEX

(Concluded from August 27 issue, page 308)

By H. SCHURER, Ph.D., F.L.A.

FOURCROY came to the conclusion that his tests pointed to the presence of nitrogen in rubber and he also noted the presence of sulphuretted hydrogen in decomposed latex. His conclusions were a pioneer achievement: he pointed out that the rubber portion was suspended within the latex, and that the separation was due to the action of oxygen and was not a straightforward evaporation process. The solidification process was a coagulation process caused either by the action of the oxygen of the air or by the oxygen component of the acids used. Fou croy proposed that either potash or caustic soda should be added to the latex in its country of origin immediately after tapping, and that would ensure that no coagulation would take place during the sea voyage. While correct in the main concerning the stabilizing effort of alkalis, in singling out these particular substances Fourcroy did his cause some harm.

Ten years later, in the chapter on rubber in his great compendium of contemporary chemical science which was published in France in 1800, and came out in English in 1804, Fourcroy came back to his latex experiments.[28] He was much more clear-headed about the trees of origin than before by stating he had examined latices from Réunion, French Guiana, and Brazil, and although these might be derived from different trees, they all presented the same characteristics. He thought that the rubber portion suspended in the latex was purer and of better quality than the rubber obtained from the globular vessels of solid rubber imported from America. In a vessel filled with oxygen the latex produced a solid elastic film much more quickly than on mere exposure to air. The rubber hydrocarbon, ready formed within the latex, was quickly separated by the action of acids. Repeating his suggestion to import latex treated with caustic alkalis from America to France Fourcroy proposed the manufacture of rubber goods from latex by a dipping process.

Fourcroy and Vauquelin returned to the subject of latex investigation for the last time in 1805 when examining a sample of Mexican *Castilloa elastica* latex presented to them by the good offices of Alexander von Humboldt and Bonpland who had brought it back from their travels in America. They made an interesting observation concerning the centripetal movement of the rubber hydrocarbon particles towards each other during the separation of the serum. This phenomenon is well known as syneresis, and it was one more contribution of the French investigators to latex science.[29]

Fourcroy's and Vauquelin's Results Tested in Mexico

The same journal to which we owe the information that Vauquelin was the joint investigator in the 1790 tests, tells us to what extent rubber had been a headache to the chemists of the time. An achievement such as Macquer's who discovered ether as a rubber solvent, was then by no means universally accepted. Macquer's papers date back to the 1760s, but in the 1790s eminent scientists such as the discoverer of the petroleum solvent for rubber, Fabbroni, were convinced that Macquer had been wrong. So far Vauquelin and Fourcroy had only experimented with a few samples of latex, portions of which had suffered decomposition and their ideas concerning the nature of latex were so different from anything assumed hitherto that their results veritably cried out for confirmation. Fortunately for the future of latex science, this confirmation came very quickly. So far it had been difficult to bring the latex to the scientists; by sending a group of scientists from Spain to Mexico, the King of Spain, unwittingly, brought a scientist to the latex. The Spanish botanist, Cervantes, leader of the group, was primarily interested in the botanical description of the Mexican rubber tree which he called *Castilloa elastica,* but he had taken good care to study the paper of Fourcroy of 1790 and repeated all the experiments Fourcroy had outlined, this time with *Castilloa elastica* latex, sent to him in Mexico City from Vera Cruz. In 1794 Cervantes read a detailed paper on the *Castilloa elastica* tree in Mexico City.[30] While in itself his contribution to latex science was of no great originality, as it followed Fourcroy and Vauquelin closely, it was of importance — considering the almost complete lack of latex samples in Europe — as a confirmation of the revolutionary views put forward by the two French authors. Cervantes was the first to mention acetic acid among other acids as a coagulant, but he did not go out of his way to propose this particular acid as the coagulant to use in practical latex work; a hundred years had to pass before this suggestion was made by J. Parkin in 1898. Cervantes, too, considered that Fourcroy's suggestion of the coagulation inhibiting function of caustic alkalis was not justified, and these caustic alkalis indeed were not suitable for the purpose Fourcroy suggested them for, yet Fourcroy's general idea was the one to prove useful in the long run; again half a century was to pass before ammonia was suggested by W. Johnson in 1853. Cervantes had taken good care to point out that his alkali tests had not been conclusive, owing to lack of time. Taking the main effect of Cervantes' paper, it was strongly for the idea that what occurred in the solidification of rubber was a coagulation process induced by the action of the oxygen of the air or by the action of acids. One might think that a paper read in Mexico in 1794 would remain unknown to the scientific world of Europe, but far from it. In 1801 an Italian translation of Cervantes' paper appeared in Milan, and in 1805 the botanical part of the essay came out in English translation in a collection of papers on botany. An Italian scientist, Carradori, examining the latices of indigenous plants to compare their properties with the rubber latex described by Fourcroy and Vauquelin, as well as by Cervantes, makes it very clear to what extent in the scientific world of Europe Cervantes' paper was appreciated as a confirmation of the main results of Fourcroy obtained on the spot. Carradori's paper was read to a learned society in Florence in 1803 and was printed in several Italian scientific journals.[31] In Carradori's view, the interpretation of the solidification of rubber as a coagulation process was firmly established by the work achieved by the French and Spanish scientists.

Howison Confirms Fourcroy's Theories

Contrary to expectations, the real pioneer achievement in the study of latex had been done in Europe, but in the nature of things, botanical exploration, the discovery of new rubber trees in other parts of the world would, of course, powerfully contribute, if only to confirm the results of Fourcroy and Vauquelin. This had happened in the case of the pioneer description of the rubber tree of Mexico by Cervantes, and it was to happen in the case of the discovery of Asiatic rubber vines. At some time in the 1790s the surgeon James Howison came across an elastic gum vine in Penang, then called Prince of Wales Island. When cutting through the jungle with his bush knife, the latex stuck to the blade and he knew enough of botany to realize another rubber tree had been discovered. It was to be called *Urceola elastica*. At the time, quite naturally, he had no access to the literature on the subject, but by the time he wrote his report he had read the basic article by Fourcroy of 1790. As he carefully pointed out, he was unaware at the time of Fourcroy's suggestion of using alkalis as coagulation inhibitors, and therefore did not do any of the tests along this line, but in the case of acids, he mentioned their coagulating effect, without, however, describing any experiments or going into details on the subject. It appears likely that he hit on the principle of acid coagulation independently himself, without knowing it had been discovered before. Howison emphasized the resemblance of latex to milk, the crucial effect of the exposure to air, and the possibility of keeping it liquid in a hermetically closed vessel. He noted the nature of latex proofing textiles very clearly, and for the first time was such an observation put down. 'Upon becoming dry, not only every thread, but every fibre of the cotton had its own distinct envelope, and in consequence was equally capable of resisting the action of foreign bodies as if of solid gum.' Howison, in his experiments with latex proofing textiles, also made suggestions for latex proofing machinery, resembling the spreading machines later to be used by Macintosh and Hancock. He envisaged a cistern filled with latex, a crossbar in the centre under which the cloth would be pulled through the latex, and two rollers through which the proofed cloth was to pass.[32]

Roxburgh's Contribution

The famous botanist, W. Roxburgh, to whom the details of Howison's discovery were submitted, made a botanical description of the elastic gum vine, and experimented with the solid rubber of this newly-termed *Urceola elastica*. He, too, noted that its latex was a 'milky fluid which on exposure to the open air separates into an elastic coagulum and watery liquid.'[33]

In 1810, Roxburgh, in his turn, discovered another Asiatic rubber tree which he termed *Ficus elastica* and described it in his *Hortus bengalensis* of 1814 in a few words.[34] In 1811 he sent samples of his 'Bengal rubber' through his agent, J. Amos, to the Royal Society of Arts and tried to arouse interest in this new raw material of British India.[35] Later he would repeat Howison's remarks on the resemblance of latex to milk in similar words: 'When this juice is exposed to the air, like milk when rennet is added to it, it separates spontaneously into the firm elastic substance itself and a foetid whey-coloured liquid.'[36] *Urceola elastica* rubber, as Borneo rubber, and *Ficus elastica* rubber, as Assam and Java rubber were to be commodities of British commerce in the 19th century. While not a factor of major importance, it may be added that by the end of the 18th century some authors began to realize that the rubber described by Fresneau, La Condamine, Aublet, C. Richard and Delaborde in French Guiana had been described by some of the older Spanish authors since the discovery of America. Cervantes knew perfectly well that his *Castilloa elastica* was the rubber tree of ancient Mexico described by F. Hernandez in the 16th century. In a book by J. C. Carli, *Lettres Américaines*, whose second edition was published in 1792, the old Spanish authors who describe rubber are clearly mentioned and the translator realizes the same substance is involved. The anonymous translator, in 1792, is quite firm in assuming that rubber is the product of a coagulation product, and that was the line where the older authors and the most recent investigators agreed.[37]

Coagulation Theory Gains Ground

A. Rees' *Cyclopaedia* of 1819 makes it quite clear to what extent first-hand accounts such as Howison's had confirmed the impression that a coagulation process took place in the solidification of rubber. It was from Howison's account, too, that Rees' article drew the conclusion that acid induced coagulation. Whether or no Howison had discovered the phenomenon himself, as seems likely indeed, his assertion based on first-hand knowledge of latex obtained on the spot, carried considerable authority and found entrance into the standard reference works.[38]

Hancock Imports Latex

In 1824, Thomas Hancock, indefatigable pioneer of new applications of rubber, managed to obtain a considerable quantity of latex from Central America, probably Guatemala, 'it came in vessels formed of two or three joints of the larger kind of cane . . . with a small hole at the end securely stopped.'[39] Twelve years later the *Mechanics' Magazine*, in a survey of the development of the British rubber industry, would state that 'Mr Hancock seems to be the only person who has succeeded in procuring the liquid juice.'[40] In the same year Hancock took out a patent for making artificial leather, utilizing latex, and as the term latex itself was not in use at the time, and the substance was not a familiar one, Hancock had to specify the substance he proposed in some detail. The passage is interesting as it shows that Fourcroy's chapter on rubber, in the English translation of his great compendium of contemporary chemical science was well known to Hancock, and therefore Hancock was *au fait* with Fourcroy's proposal of shipping latex from America to Europe, the substance being mixed with caustic alkalis which Fourcroy considered to be effective coagulation inhibitors.

'The liquid I use . . . is said to be the juice obtained from certain trees which grow in several parts of South America, the East Indies, and other places abroad. It is stated in Wr. William Nicholson's translation of Fourcroy's General System of Chemical Knowledge that this juice is obtained in South America from a tree called the Hevaea.' Continuing, Hancock makes it clear that he thought heat treatment essential to induce coagulation, for he carries on, 'I find that the said . . . liquid when exposed to the open air in the sun, or in a warm room becomes inspissated or dried, and then forms a substance exactly resembling and which I believe to be identically of the same nature and to possess the same properties with the substance well known by the name of caoutchouc.'[41] An identical description of latex appears in a patent application of 1825 for utilizing latex in rope making.[42]

Hancock's Disappointment

After the patents of 1824 and 1825 Hancock took out another patent in 1830 connected with the utilization

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of latex, and this time he drew the wrath of the editor of one of the journals reporting inventions on his head. W. Newton, the editor of the *London Journal of Arts and Sciences and Repertory of Patent Inventions*, when printing Hancock's specification of 1830, had a veritable outburst against the patentee. This is what Newton had to say in a footnote to the specification, 'It is extraordinary that in the several specifications of patents in which this material, caoutchouc, has been proposed to be applied in a liquid state, it has been almost invariably said that the milky gum in the natural liquid form in which it is discharged from its native tree, is the material to be employed; whereas it is notorious that the natural liquid gum has never been brought to this country, except in one instance, we believe, in a very small quantity, and then was found to be ineligible for the purpose, and that in all cases where liquid rubber has been used as an article of manufacture, it has invariably been the bottle rubber, or cake rubber, dissolved in naphtha, or some other spirit, and not the native milky liquor.'[43] Newton proved right, Hancock's optimistic assumption that if latex had been successfully imported once, in 1824, it might be imported again, proved unfounded. Further attempts of bringing latex to England turned out to be failures, and all the latex patents expired before the latex itself could be produced. Hancock had to admit defeat and had to take a course towards a different approach to the rubber problem. In 1857, he had to admit, 'Before the difficulty of dissolving ordinary rubber was overcome, it was thought that the liquid, if it could be obtained, would be invaluable, but . . . the dry material . . . is the cheapest and most easily applied, although to persons unacquainted with practical details this may appear enigmatical.'[44] When writing his great account, Hancock was just in time to have heard that in recent years ammonia as a coagulation inhibitor had been successfully used,[45] but this suggestion had only been put forward in 1853 and had come too late, in Hancock's personal case, to influence his career. Thoroughly acquainted as Hancock was with Fourcroy's work, the French author had not made this vitally important suggestion.

Faraday's Analysis

While to Hancock all his endeavours to establish a latex industry in his country must have appeared as so many vain efforts and a source of great disappointment, his work in this field proved instrumental in achieving a great triumph of chemical science, in an indirect manner. It was with *Castilloa elastica* latex supplied by Hancock that Faraday carried out his pioneer analysis of 'pure caoutchouc,' which was published in 1826.[46] Faraday's work had been carried out with the latex which Hancock reports receiving in 1824. While not trying to give a summary of Faraday's investigations, it might be recalled that he clearly recognized the hydrocarbon character of rubber, emphasized the property of rubber as a non-conductor of electricity and therefore potential insulating material and demonstrated the protein content of rubber, thus explaining the existence of nitrogen in the substance which Fourcroy and Vauquelin had noticed.

The Word Latex Appears in Connexion With Rubber

By a curious coincidence in the same year in which Goodyear's discovery initiated a new phase of rubber history, in 1839, the term latex appears for the first time in English botanical literature in connexion with rubber. In all the writings discussed hitherto, from 1530 to 1839, words like milk, juice, sap, and so on had been loosely employed to denote the substance. For the first time the term latex as applied to rubber latex was used in the third edition of John Lindley's *Introduction to Botany*, published in 1839. 'Upon exposure to the air, latex separates into a coagulum of a tenacious elastic quality, and a serum, the former being sometimes analogous to caoutchouc,' writes Lindley.[47] With Goodyear's discovery another important term came into rubber nomenclature, and somehow, in the vital year 1839 not only two phases of rubber terminology, but two phases of the history of the substance are linked by the new term coming unobtrusively into the language.

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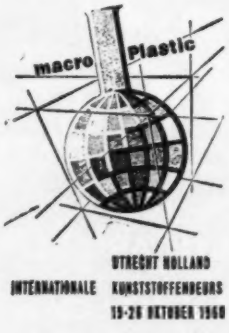


NEWS ABOUT MACROPLASTIC

●Allied Chemical International will exhibit alkyd moulding compounds, nylon moulding and extrusion materials, low molecular weight polythenes and urethane products at the MacroPlastic exhibition at Utrecht (October 19-26). Also featured will be the range of Harmon organic pigments, and colours dispersed in vinyl resins for easy processing.

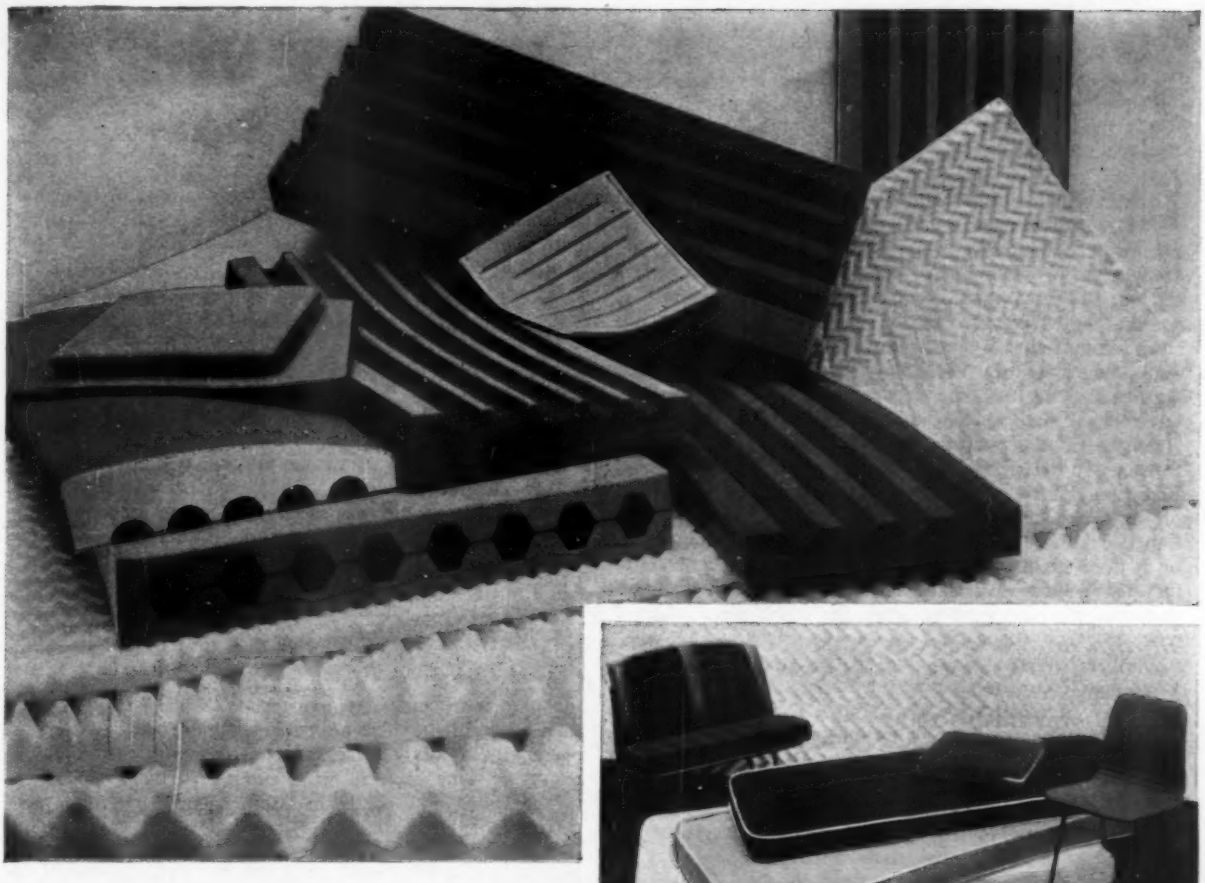
●Products made from Hostalen G low pressure polythene, and Hostalen PP polypropylene will be shown by Farbwerke Hoechst AG. The production of Hostalen will be demonstrated by a continuously operating polymerization plant which gained an award at the Brussels Universal Exhibition.

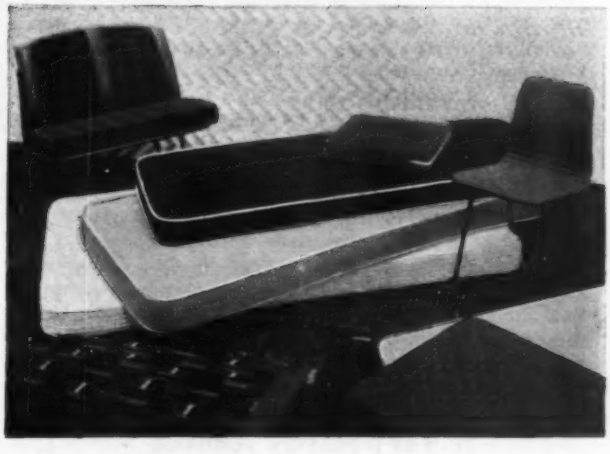
●On show in the machinery section will be extruders, dies and auxiliary equipment manufactured by Barmer Maschinenfabrik Aktiengesellschaft.

●Epoxy adhesives and casting resins will be exhibited on a stand of Ciba, Rubber and Asbestos Corparation and Houghton Laboratories Inc.

●Rubberfabriek 'Helvoet' N.V. will show moulded products made from a variety of thermoplastics — nylon, PVC, polythene, polystyrene, cellulose acetate, CAB, and acrylate.

●A range of extruders is being exhibited by Frieseke and Hoepfner GmbH, whose other products include take-off conveyors, cooling tanks, wind-up units, cutting mills, vibrator feeders and calibrating equipment.





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VIEWS *and* REVIEWS

DR PHILIP SCHIDROWITZ wrote 'Views and Reviews' regularly each week for 40 years, in itself no mean achievement. To the task, he brought a wide knowledge of the industry he had himself significantly shaped, and because of his achievements he spoke with a personal authority and he was listened to readily; I can envy but not supply this distinction.

For much of my life I have lived in the belief that writing is done for someone to read and, at this moment when I take over a well-established feature, I cannot help trying to form a picture of its readers. I know some of them well: by friendships of long standing, Geoffrey and Reg and Heinrich; by acquaintance across committee or dining tables, Dr Smith, Herr Braun, Sir Alex Robinson. Others I know by repute, by seeing their names in print, or at the bottom of letters. Most of them are nameless to me and, no doubt, are the usual assortment of the sympathetic, the antagonistic, and the indifferent. Can I write to please them all?

Well, no — or, at least, not all the time. At the best, I suppose, I can hope to interest some of them some of the time. I shall strive no higher.

My instructions are to 'view and review' what I please. I am certain to do it differently from Dr Schidrowitz who spoke from the eminence of an historic place in the industry, while all I claim is to have knocked about in rubber for forty years. As to approach, I prefer the scientific to the traditional or the rhetorical.

All of this is bound to appear in the 'Views and Reviews' of the next few weeks. I am asked to remember that the accent is on the Views, which I would like to interpret as meaning that this weekly contribution should be individual without being egotistical, critical without being offensive, and objective without being dull.

A Very Hardy Annual

One of the first items to be 'viewed and reviewed' must be the 'Annual Report on the Progress of Rubber Technology' for 1959, because, although it was published several months ago now, it merits a special word of praise for its contribution to the life of the industry. Nothing else is quite the same. It is in itself an annual 'Views and Reviews,' for its two dozen reviewers are, in the words of the Chairman of the Sub-Committee responsible for the Report, 'invited to be selective in what they review, including only what in their opinion represents significant progress, and to give readers the benefit of their expert critical opinion.' Naturally, some do this better than others. In at least one instance the thought arises that if the author had been really selective his section might have become like the celebrated chapter on 'The Snakes of Ireland.'

No one shall deprive me now of the joy of saying in public what I have often said in private, that the Annual Report is one of the things the IRI does. Anything else I shall say about it is intended to improve it. I think so much of it, that I would make it a compulsory part of the IRI subscription.

I would do three other things with it: reclassify the subjects, include an editorial and improve the indexes.

It seems to me to have three main types of readers: those who want an all-over, up-to-date view of progress in the rubber industry, the expert who wants to see what another expert has said about progress in the field they both share, and the student who wants to refer to it for a specific purpose. I suspect that the third — future reference — is its main use, but to help the general reader I would alter the system of classification so as to reduce a certain diffuseness which is apparent in places and use the space saved to write a kind of editorial preface 'viewing and reviewing' all the contributions, that is providing in one short essay a complete survey of technical progress in the industry during the year.

I do not seek to eliminate all the overlapping which occurs now but I would wish to reduce it. Something seems to be wrong, for instance, when a large part of the significant progress in elastomeric foams has to be sought, not in 'Cellular Rubber' but under 'Synthetic Rubber.' Such discrepancies are not really serious if there is a good alphabetic index but this year's leaves something to be desired.

Lack of Consistency

Apart from one or two misprints — and since I found such by accident, there are probably more — and editorial oversights, there is a lack of consistency in terms which results in some subjects being entered partly in one place in the index and partly in another, and sometimes not getting indexed at all.

I repeat that these remarks are intended to suggest improvements in a publication which is already excellent and reflects credit on all the many people who co-operate to produce it.

I suppose very few people sit down and read the Report right through, as I did. It can be recommended; some of the chapters are very thoughtful and stimulating.

The picture I got was that 1959 was a year of progress, distinct but patchy. World consumption of rubber of all sorts increased by about 17% over the figure for the previous year to a new high record of over 3,600,000 tons. This was made up of a 5% increase in the consumption of natural rubber, to just over two million tons, and an increase of over 25% in synthetic rubber, to just over 1.5 million tons. A dramatic expansion in European demand is expected to be shown in this year's picture.

Although both technologically and economically the future lies with the synthetic product, rubber prices and rubber share prices advanced all round; everyone had a prosperous time.

Overall Economic Picture

The plantations, which are at full stretch, have had some disappointments with many of the high-yielding clones because they have not turned out to be entirely satisfactory in other respects and the conclusion has been reached that in this development (and how true of *all* developments!) it is now regarded as essential to consider the overall economic picture rather than be guided by yield figures alone. Much technical work was devoted to improving the variability of natural rubber.

Expanding production of synthetic rubbers was one of the outstanding features of the year; consumption was three times that of 1950 and should be four times by 1965. Already there are over twenty commonly-known types of SBR alone and development of advanced forms of syn-

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **F. C. JENNINGS**

thetic rubbers and plastics continues rapidly in many countries, including Russia, where priority is being given to the production of heavy-duty tyres made wholly of synthetic rubber. Technically and commercially, one of the most interesting developments is in the field of poly-cis-isoprene and poly-cis-butadiene; production arrangements are well advanced and the price outlook is promising.

During 1959, research was carried out in many fields of synthetic rubber but especially exploring and extending the application of Ziegler catalysts, development of polyolefines and polyurethanes (including foams), and means of cross-linking thermoplastic materials. The distinction between the plastics and the rubbers appears to be settling down to a definition of rubber as any material having elastic properties, and both materials seem to be taking their places as constituent parts of one — the high polymer — industry.

Final Synthesis Still Awaited

A striking feature of the year, from the chemist's point of view, was an apparent lessening of interest in cross-linking by means of radiation while interest in the mechanism of sulphur-vulcanization appears to be unabated, perhaps because a final synthesis of theories is still awaited.

Discussing physics, the Report does well to stress the importance of dynamic testing of rubber articles and especially the role of hysteresis in abrasion resistance. The author of the chapter on 'Physics of Raw and Vulcanized Rubber' may be forgiven (indeed, ought to be applauded) for his sarcasm when he says that dynamic testing 'might well become a more respectable pursuit than hitherto in the rubber industry.' Make the punishment fit the crime is a good rule in testing, or, put another way, the significance of a test of a service property is closely related to how near the conditions of testing-treatment are to the conditions of service.

This is not to say that there is no place in our laboratories for test methods designed to measure fundamental, unit properties, indeed, the most fruitful lines of research are those concerned with the measurement of basic properties.

So far I have glanced at about a third of this report; the remainder is mainly taken up with progress in the applications of rubber, in processes, and in machinery. There is so much of interest in it that I must leave it to a more convenient time.

Physician, Heal Thyself

Geoffrey A. Shires, who is responsible for technical literature at the Dunlop Research Centre at Birmingham, poses me a question of topical interest to technologists and scientific workers in all fields. What is to be done, he asks, about the increasing volume of technical literature? More technologists, more reports. Already we are reaching a point when it is almost impossible for the scientist to read all the relevant literature in and around his field.

Shires wonders whether the length of technical papers could be reduced, deliberately, for instance by omitting minor arguments and their related data. He recognizes that he is employed to try to save the time and trouble of laboratory men, and he hopes he is doing just that, but beyond a certain point it is impossible to read for another man. There is no doubt that abstracting, intelligently carried out, is a great help and the processing of scientific papers into abstracts in a form suitable to the technologists concerned is a profession (I almost called it an industry) of its own. 'The Literature' is indeed a large part of the cost of a modern laboratory.

It is a cost rightly incurred and likely to increase as technological publication increases. The making available of Russian technical literature has added another burden. Within our own industry, the RABRM has made a notable contribution by its translations of *Kauchuk i Rezina*, published under the title *Soviet Rubber Technology* by Maclaren and Sons Ltd., proprietors of *RŽIP*, but so far no one has found a way of giving the technologist more time to read them.

Is it possible that the scientist himself could help?

Television Technique and Computers

It may be that the conveying of ideas and information by means of black marks on white paper, that is by printing and writing, is not the quickest way. Is a pictographic development of television technique a way out?

The computer may help. Already an American computer is making a daily translation from *Pravda* and although there are still a number of difficult problems awaiting solution in this field, it is a two million dollar research project in the USA and there are three groups at work on it in Britain. Following automatic translation could come automatic abstracting and indexing, or instead of preparing a translation, the electronic scanner or reader could be set to work either making indexes or picking out key subjects.

There is not much point in translating 500 million words of Russian each year if no one has time to read them. In my own time, there has been a revolution in the apparatus and methods used in the analytical laboratory; I hope it will not be long before I see a similar change in the technical library.

CHARLES JENNINGS

Spray Gun for Foam

A new spray gun has been described by the European Productivity Agency and is known as the 'Kreidl Uropor,' manufactured by Kreidl K.G., Engerthstr. 169, Vienna II. This spray gun generates urea formaldehyde foam at the rate of 1-2cu.m. per hour. A salient feature of the new gun is the simplicity of its controls and its insensitivity to changing operating conditions.

The two components of the foam — resin and hardener — are dissolved in powdered form in two containers. The suction line of a diaphragm pump is inserted into each container. Both pumps are driven by compressed air gated by a common control set. Consequently, the three foam-forming components — resin, hardener and air — are controlled by a common power source, and any fluctuation in the supply of compressed air results in a corresponding fluctuation of foam delivery without alteration of the composition of the foam. An *on-off* master switch controls the delivery, and three independent controls permit the correct dosing of the mixture. Kreidl-Uropor foam has a density of 5-12kg. cu.m.

Reinforced Plastics Protected Discoverer XIII

A NOSE cone heat shield made of several combinations of fabrics impregnated with phenolic resin provided the necessary protection for the US Discoverer XIII's successful space flight and return in August.

The shield performs double duty as both a structural member and a protective cover. It acts as a shell or reinforced structure to withstand tremendous pressures and as a heat dissipating material to protect the package (aeromedical specimens or instrumentation) from white hot heat.

The nose cone shield was produced by machine tape winding, a process developed by B. F. Goodrich and accomplished on equipment design by the company at its Akron plant. The material is wound under controlled tension and heat. Vulcanizing the cone takes days at extremely high pressures. Temperatures are carefully controlled both during vulcanization and throughout the cool-down. By this means, it is said, resin content, specific gravity and the dimensional stability of the part is controlled to a fine degree.

B. F. Goodrich have also produced a heat shield which protected a full-scale model of the Project Mercury manned-space flight capsule which was boosted 100 miles into space on an Atlas ICBM launched from Cape Canaveral — and recovered — last year. This shield, made of laminated glass fibre and resin, endured temperatures of 3,000°F.

The company has also produced re-entry shields in thicknesses varying from ¾in. to 6in., the thickness depending on the velocity, angle of the vehicle's re-entry and on the aerodynamic design of the vehicle. The machine tape winding technique is used to make other space-heat resistant components such as missile sleeves, airframe structural components, flame deflectors, flare cases, racket nozzles, frustrums and cylinders.

Lighter Dictating

A transistorized portable dictation machine developed in the USA by Comptometer Corp. has end caps and microphone housing made of Cycolac, ABS thermoplastic made by Borg-Warner, whose UK agents are Anchor Chemical.

Cycolac keeps the overall weight of the recorder down to 4½lb., and using the material enabled the manufacturer to achieve greater design flexibility, and realize reductions in material and fabrication costs.

Mulroy—Number 500

(*See page* 350)

'I think she's bluffing—her old man works in a latex foam factory!'

To recover composure in a crisis

Consider the high and rising cost of solvents. Of anything. Of everything.
What can you do without? What, in Heaven's name, can you do?
Sit down, my dear Sir. Dictate a letter to Sutcliffe Speakman: "I am interested in Solvent Recovery. I understand you will either suggest a way of recovering solvent at a profit to my firm, or will say that it cannot be done . . ."
You should now be well on the way to recovering your composure—and your solvent.
But in announcing this to your colleagues, temper your jubilation with urbanity.
After all, you always *were* rather brilliant . . .

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SUTCLIFFE, SPEAKMAN & CO LTD · Leigh · Lancashire · Tel Leigh 94 (5 lines) *London Office* 2 *Caxton St* · *Westminster* · *SW1* · *Tel Abbey* 3085

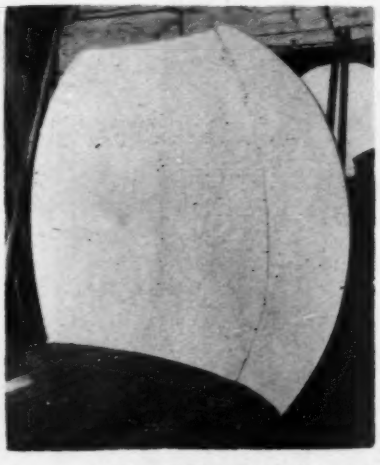
Plastics and Rubber at Farnborough

PREVIEW OF THE SBAC SHOW

THE 21st SBAC show opens at Farnborough on September 5, and although the main attraction, for the general public at least, is the flying display, there are many interesting features in the static exhibition.

Chief feature of the Dunlop stand will be the new air-cooled brake for aircraft, which is now fitted to the Comet IVB and will be part of the equipment of the new DH121 airliner.

This brake has overcome the long turn-round time at airports caused by heat build-up in the wheels and tyres of aircraft by means of a built-in



Concave side of Vanguard internal bulkhead, fabricated from resinated glass cloth. The convex side is coated in PVC coated Tyglas

fan located in the axle. This fan, driven by a small electric motor, draws air through the wheel creating considerable forced draught. Results of tests have shown that turn-round time could be cut from 100 minutes to 13 minutes.

At the same time maximum temperature reached by the tyre beads is reduced from 155°C. to 55°C. and this is of great importance as it very much reduces the risk of a blow out, which might occur after landing or take off with serious consequences.

Other exhibits will include the latest types of aircraft tyres and wheels, guided missile components, axle mounted maxaret anti-skid units, rams and valves for high temperature operation on jet engine systems and thermal de-icing installations.

Honeycomb

The most striking exhibit to be shown by CIBA (ARL) Ltd. will be a 12ft. 6in. long rudder panel from the Vickers Vanguard. This illustrates a typical use of Aeroweb honeycomb core in aircraft structures.

Redux and Hidux bonding will be specially featured, and examples of bonded components from several different aircraft will be on display. Redux bonding has been employed in more than 70 different types of aircraft, and is being put to extensive use in a number of new aircraft now under construction.

Araldite epoxy resins, which have many uses in the aircraft industry, including the manufacture of press tools and glass laminated structures, and the potting of electronic components, will also be shown. An exhibit constructed from Araldite and glasscloth will be a 5ft. long radome nose cone for a guided missile, manufactured by the Bristol Aircraft Company.

Reinforced Plastics

Centrepiece of Fothergill and Harvey's stand will be an interior bulkhead for the Vickers Vanguard, made from Tyglas reinforced plastic by C. F. Taylor (Plastics) Ltd.

Reinforced at the ribs with Tyglas tape, the bulkhead is fabricated with three separate sections to form an intricate curved shape. The convex side is covered with scarlet PVC-coated Tyglas cloth, thus simulating the finished article positioned in the aircraft; segments are left uncovered to show cloth construction.

Other components on show include examples of reinforced plastic ducting, and a reinforced plastic hatrack panel for the Handley Page Dart Herald. The ducting is used in the Vanguard air circulation system beneath the fuselage flooring.

Racks and Radomes

The uses of Bakelite plastics in the aeronautical field, with particular emphasis on the part played by reinforced resins and copper clad laminate, will be shown on the company's stand.

A selection of components from the hundreds currently fabricated in Bakelite polyester resin by leading aircraft manufacturers will be displayed, covering a wide field ranging from radomes to luggage racks.

Another section will be mainly devoted to showing the uses of printed circuits based on copper clad Bakelite laminate, and on other sections of the stand will be Bakelite polythene and Vybak PVC insulating and sheathing materials; examples of the uses for Bakelite epoxide resins in the aircraft industry, and electrical equipment and instrument cases.

G. W. Components

Turner Brothers Asbestos Co. Ltd. will exhibit several aircraft and guided weapon components moulded in either Durestos Resinated Asbestos material or Duraglas Glass-Fibre reinforcement.

Durestos is the trade name applied to a range of resinated asbestos thermo-setting moulding material available as felts, flocks and powder.

Felt is suitable for mouldings with large surface areas, and is used in the manufacture of surveillance scanners, drop tanks, fairings, nose cones and many other aircraft and missile parts. Flocks and powder, on the other hand, provide a material from which the smallest and most intricate shapes can be produced.

PTFE Pipe

A new development — Corrugated PTFE Flexible Pipe — will be included among a range of products manufactured by Palmer Aero Products Ltd. Corrugated PTFE provides an extremely flexible conduit and is especially suitable for lightweight electrical harness.

Also featured will be a range of pipes, including PTFE and rubber. Palmer wheels, brakes, de-icing equipment, seals and mouldings will also be shown.

For many years the aircraft industry has been one of the largest users of Desoutter Portable Power tools and a complete range will be displayed, including drills, screwdrivers, nutrunners, grinders, rivet and bolt

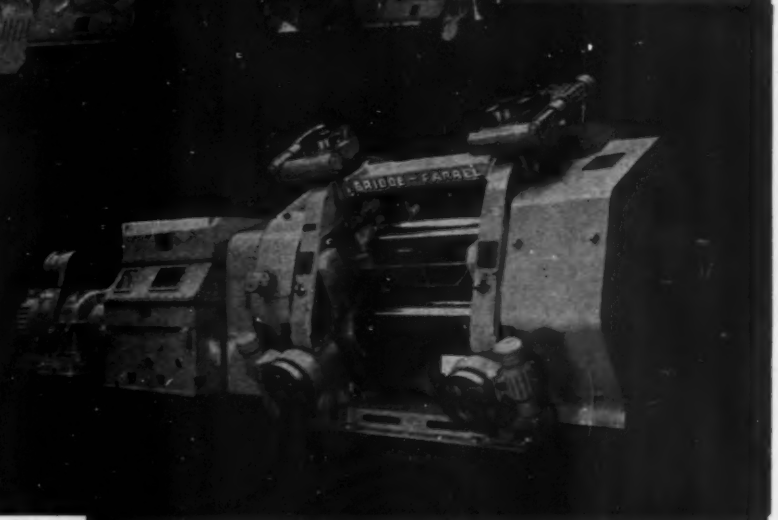
BRIDGE FARREL

. . . acclaimed equipment the ultimate in design and production efficiency

28" x 74" Inclined 'Z' Plastics Calender

Advanced engineering features include patent hydraulic loading on the final nip and all the finest features of Plastic Calender Design.

BRIDGE-FARREL Calenders give tolerances of ±.0001" on thin calendered plastic film at speeds up to 320ft. per minute.



Bridge-Farrel 24" x 66" 3 Roll Triang Calender. The illustration shows one of several machines built and in operation, and considered to [illegible] precision Rubber Calenders in the world.

BRIDGE FARREL equipment for the Plastics Industry

DAVID BRIDGE & COMPANY LIMITED CASTLETON, ROCHDALE, LANCASHIRE

Telephone: Castleton R[illegible] 57216 Telegrams: Phone Castleton Lancs

London Office: Broughton House, 6, 7, 8, Sackville

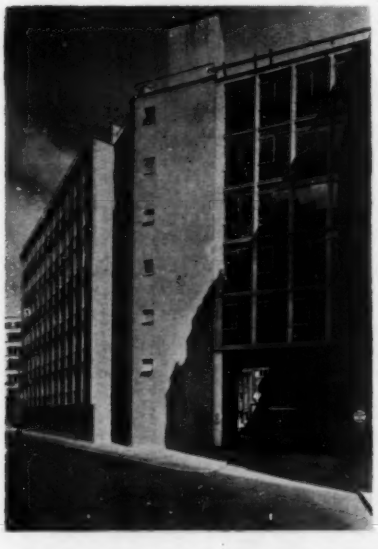
In Continuous technical association with the FARREL-BIRMINGHAM CO. INC., U.S.A. for over 40 years on the BANBURY MIXER and special machines

millers, nibblers and shears, a number of which will be available for working demonstration.

I.C.I. Ltd. Plastics Division stand will feature some of the varied applications of their products in the aircraft industry. These will include PTFE components, a Darvic PVC light panel cover as used in the Vanguard, unbreakable metallized melinex mirrors and Perspex windows and crockery.

Union Carbide's New Headquarters

Union Carbide Ltd. moved their head office to Union Carbide House, 8 Grafton Street, London, W.1, on August 27. The headquarters of the chemicals and polythene divisions will also be in this building, which stands



on the former site of the famous Grafton Galleries, bombed during the war.

The facade has been rebuilt to blend in with adjoining buildings and the inside redesigned and rebuilt. A large nine-storey building with curtain-wall elevation has been erected in Bruton Lane, at a lower level, with a bridge (pictured) connecting the upper floors to 8 Grafton Street.

There is an entrance in Bruton Lane, but the reception area is at Grafton Street.

A counter stand consisting of three sets of twin chutes, each set holding a different Rowntree product — Fruit Gums, Fruit Pastilles and Liquorice Gums — is being moulded in Styron 475 polystyrene by Stewart Plastics of Croydon.

Petrochemical Complex for Argentina

FIVE COMPANIES TO BUILD $74.5 m. GROUP OF PLANTS

PLANS by a group of US companies to build a $74.5m. group of petrochemical plants in Argentina were announced in Houston, Texas, on August 29.

The group consists of the Continental Oil Company, the Cities Service Company, the US Rubber Co., the Witco Chemical Co., and the Fish International Corp.

'We are ready to begin construction immediately upon acceptance by the Argentine Government,' a spokesman of Fish International said.

The plants, which would employ about 700 workers, will take about 36 months for completion, although first units should be producing within 18 months.

SBR and Carbon Black

The plants will produce some 45,000 tons a year of synthetic rubber, 11,500 tons of carbon black and 7,000 tons of styrene in addition to amounts used in the rubber production.

The plants will also turn out benzene and other intermediate chemicals.

The complex will be built at San Lorenzo, a deep water port on the Rio Parana, according to the spokesman.

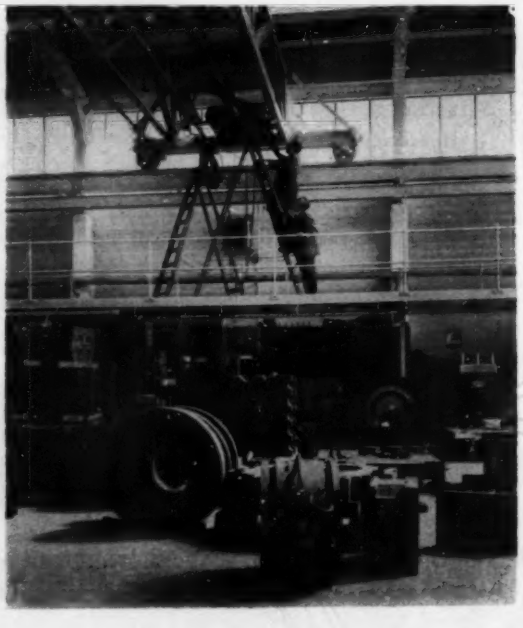
An Argentine corporation — Pasa — was formed earlier this year by the US group to own and operate the plants.

Pay Rates Up

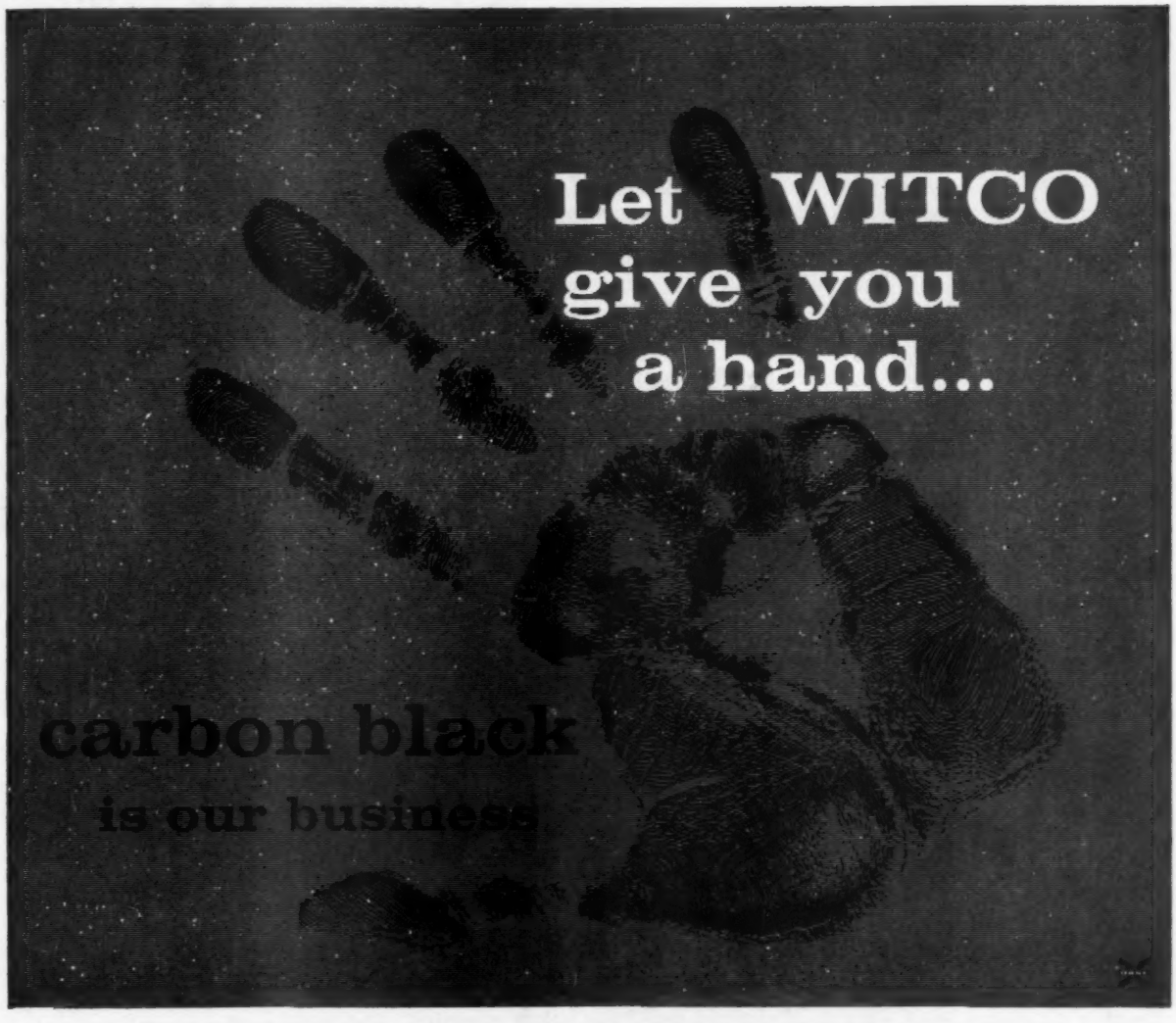
All workers whose rates of pay are regulated by the National Joint Industrial Council for the Rubber Manufacturing Industry are to get pay increases of at least 1¾d. per hour for men and 1¼d. per hour for women. The increases are under an agreement which will operate from the first pay period falling on or after September 11.

NJIC basic time rates will be advanced by 3¼d. per hour for men and 2¾d. per hour for women. The full amount of these increases will be paid (a) in the case of men already earning up to 4½d. per hour above their present NJIC grade rates and (b) in the case of women already earning up to 1½d. an hour above their present NJIC grade rates. For workers whose earnings are in excess of these limits, the increase will be on a sliding scale, but, says the NJIC, in no case will the advance be less than 1¾d. per hour for men and 1¼d. per hour for women.

For systems of payment by results, the NJIC grade rates are also being advanced.



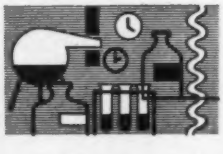
Examining a 5-ton travelling crane in the new production shop at the Halex plant at Highams Park. (*RJIP*, **August 20, 261). The crane is used for transporting tools within the shop**



CONTINEX

HAF and ISAF

Our new Dutch plant is an exact replica of the many carbon black plants our group own in America, ensuring absolutely an equivalent material to the American grades of **Continex HAF** and **Continex ISAF**



Our technical service is ensured by a team of specialists American trained – and a well-equipped workman-like laboratory at Rotterdam – they are there to serve and to advise you.

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Distribution by Witco with years of carbon black experience behind them and a world-wide team of experienced agents and branch offices to serve you.

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(Distributors for Continental Columbian Carbon Nederland N.V.)

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MEN *and* MATTERS

A Review of People and Events

by Peter Richards

THE other day a letter came in from Hamburg asking if *RJIP* had published their 'famous cartoons' in book form. This isn't an unusual request: the *RJIP* cartoon has been laughed at and quoted all over the world — wherever there is a polymer industry. Many of the original drawings have found themselves on boardroom and office walls.

This week we publish John Mulroy's five hundredth cartoon, and to celebrate the occasion, it is the first one to appear in colour.

John Mulroy is a Lincolnshire man who was educated in Birmingham — at St. Phillip's Grammar School and Aston Technical College. From 1938-40 he was chief draughtsman at P. B. Cow.

After joining the Empire Rubber Co. as chief draughtsman in 1945, he toured the USA in 1953, visiting many rubber companies. In 1954 he became technical representative to the motor industry with Empire Rubber. He was appointed to the Board of Chichester Rubber Co. last year.

The Character Takes Over

He has been providing a dose of humour for *RJIP* every week for ten years — his first cartoon was published in the Journal after his cartoons had appeared in Empire Rubber's house magazine. Yet he never shows any sign of running short of ideas.

Ideas come to him at odd moments; in his bath (he keeps a pad in the bathroom) and frequently when he's driving. When he draws a character (the only thing that stops his pencil in the evening is when there's boxing or football on television) we can certainly say that he puts himself into his work — as the cartoon takes shape we are assured that Mulroy gets to look more and more like the character he's drawing.

Getting Rid of the Name

The company's name is not always a thing to be proud of. Sometimes it's a nuisance. It is, for instance, one of the factors that lowers the resale price of a company van. It bites deeply into the paint and removing it means a costly respray.

The manager of a Rootes Group service store in Maidstone, F. C. Aulagneir, has found a neat way of getting round the problem.

When he puts a new van into service he has the name painted on a piece of Fablon self-adhesive PVC, and sticks it on. This method of lettering has been given a five months' trial run with very satisfactory results — and when the time to sell the van comes, it will simply be a matter of tearing off the Fablon and polishing the panels down.

Campaigns Breaking

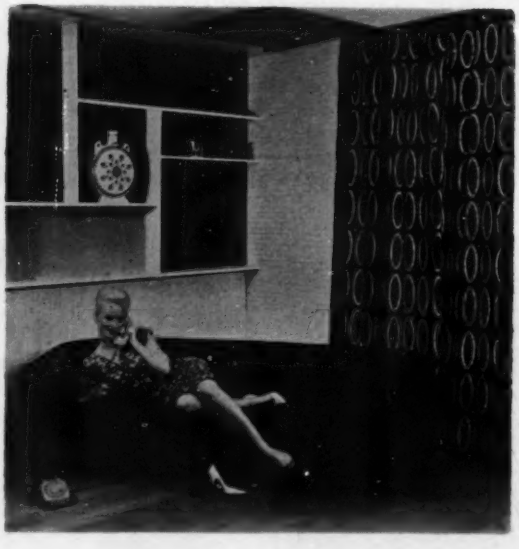
With the silly season beginning to slip into the background, heavy advertising campaigns are beginning to break. What seems now like an old-stager — although it cannot have been going for more than four years — Storeys Con-Tact will get off to a good start with large spaces in three national dailies and colour advertisements in the women's magazines.

A newcomer, Sandran vinyl floor covering, is also getting heavy promotion. Made by Williamson-Sandura Ltd.— a company formed by Jas. Williamson of Lancaster and the US Sandura Co.— this covering consists of three materials laminated together. On top of a heavily saturated base is a high vinylcel on which the pattern is rotogravure printed, and on top of this in turn is a coating of vinyl.

An intensive advertising campaign began on Monday with spaces in the *Express* and *Mirror*.

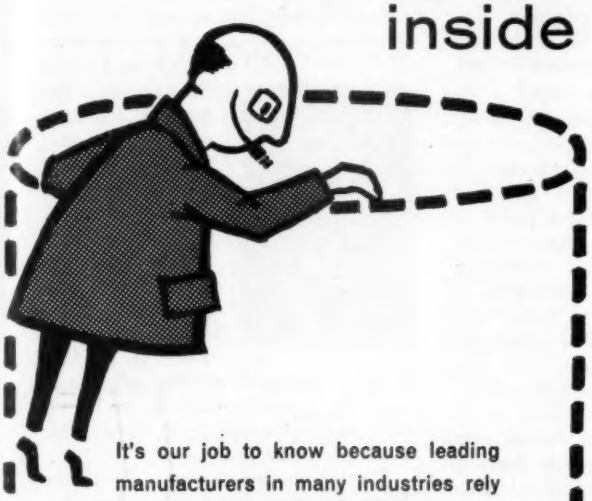
Sales Manager at 29

Success has come quickly to Roy Mills, who has been appointed sales manager of Kay Brothers Plastics at 29. Kay Brothers, a member of the Reckitt and Colman group, manufactures plastics foam for the car and upholstery fields. Mr Mills has been with Kay Brothers Ltd. since August of last year. In 1953 he joined Vantona Textiles, Manchester, where he was assistant export manager for four years. He then obtained selling experience on the home market as an area representative for the English Rose nylon hosiery firm before becoming sales manager for Kay Brothers Ltd. at



The living room at Storey's 'Living With Plastics' exhibition, running at the Tea Centre, Regent Street, London (*RJIP*, August 27, 309). The sofa is in long flock Norzon; curtains are Storey's PVC; floor is Vinolay vinyl sheeting by Dunlopillo and the telephone is moulded from Styron polystyrene by Autophone Ltd.

We know what goes on inside



It's our job to know because leading manufacturers in many industries rely on us to weave just the right foundation fabric for their particular products. We've been weaving at **Hay & Robertson for over 100 years,** and this accumulated experience plus our highly geared organisation of craftsmen and technicians offers you the most comprehensive and dependable foundation fabric service available to industry today. Whatever your fabric requirements or problems consult Hay & Robertson first for the right answer quickly.

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For
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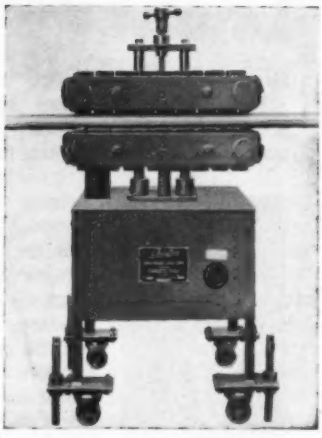
0-2½ins. capacity, Price £395. 0-4½ins. capacity. Price £495. Larger models available.

Patent No. 1206268
Pro Patents 20423/57
753734, 49421, 744280.



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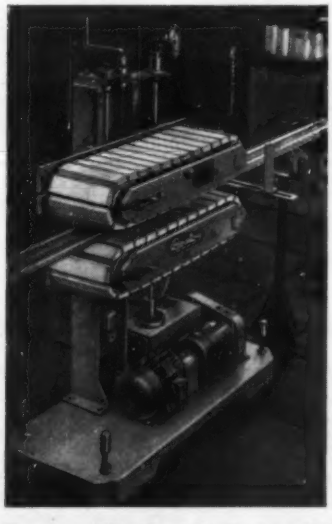
Finest construction
Magnificent performance
Unfailing reliability

—at world's lowest prices!



Infinitely variable speed range.
Ball and roller bearings.
Finest components.
Speed change by quality gearbox.

Hydraulic or Electronic Drive.
Standard speed range 4 ins. - 74 ft. per min.
Higher speeds available.

Photo by kind permission of IMPERIAL CHEMICAL INDUSTRIES LTD. showing one of their Boston machines in operation.

Boston Marine & General Engineering Co. Ltd
Viceroy Works, Low Fields Road, Leeds 12, England.
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Please send without obligation, full details of your Boston Universal Take-Off for a maximum diameter of .....

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..... (R.J.)

Reddish, where he had 25 representatives under him.

Head of Firestone France

Robert Bult has been appointed president-managing director of Firestone France. He has been managing director of Firestone's affiliate company in Pratteln, Switzerland, for the past 25 years. In his new position, Mr Bult will be in charge of all Firestone operations in France, including the company's new tyre plant in Bethune and the synthetic rubber plant in Port Jerome. Both plants are now under construction.

A native of Rotterdam, Holland, Mr Bult was associated with the United Dutch Rubber Works for three years and in 1925 became a Firestone distributor in Switzerland. In 1934 in co-operation with other Swiss industrialists, Mr Bult started the Fabrik für Firestone Produkte AG., Firestone's affiliate in Switzerland.

Headquarters for Firestone France will be in Paris at 50 Champs Elysees.

Resins in Dochesworde

'You may easily pass unknowingly within a mile or two of Duxford,' says the introduction to a new booklet from Ciba (ARL), a little sadly.

In fact, Duxford is not an easy place to find — going down the A11 or the A505 you can easily miss it. Realizing this, Ciba (ARL) have brought out a clever little booklet, which not only includes maps and directions on how to get there ('. . . on the right . . . is the hamlet called Dochesworde in the Domesday Book . . .'), but also maps out their many products in the synthetic resin adhesives field.

I should imagine that this booklet will earn its production cost over and over again. Too few firms cater for their visitors in such a way. No directions at all, or a few lines tacked on the end of a letter are given — whereas with the Ciba booklet visitors will not only know how to get there, but will have a comprehensive picture of the firm's activities by the time they arrive.

Star Performance

William McKinnon, vice-president of B. F. Goodrich Liberia Inc., the company's rubber growing subsidiary in Africa, has been made a Grand Commander of the Order of the African Star by the Liberian government.

Award of the decoration was made last month in Monrovia on the anniversary of Liberian independence.

New Publicity Manager

Dunlop have appointed J. D. Sinclair to be publicity manager for their tyre division. This is a new appointment and Mr Sinclair will be responsible to the company's public relations officer, J. Campbell Fraser. He will be based at Fort Dunlop.

Mr Sinclair first joined Dunlop at Glasgow in 1947. In 1956 he became manager of the tyre sales department at Fort Dunlop and dealt with sales of commercial, car, motor cycle and cycle tyres.

During the war he served with the Fleet Air Arm and in 1943 was shot down over the Mediterranean. He spent the remainder of the war in Italian and German prison camps. He was educated at Rendcomb College and Glasgow University and is the son of Sir William Sinclair, former director of Dunlop (Scotland) Ltd.

* * *

Latest from America — transparent sandals containing a liquid in which float toy fish. These dart in and out of 'pebbles' with every step the wearer takes. The sandals are moulded in Tenite acetate.

Ralph Oakes is joining Palmers Reinforced Plastics Ltd., as production manager. He has been chief plastics engineer for De Havilland Propellers Ltd., and technical director to Fibreglass Reinforced Plastics Ltd.

Question Corner — 133

(Second Series)

458. Are there any tests that can be used for measuring the slip properties of plastics film?

(Answer next week)

Answer to Question Corner — 132

457. Resistance to tearing by a fast shearing force may be measured by the Elmendorf Tearing Tester (ASTM D689-44).

The moving part of the apparatus is a free-swinging pendulum initially held in a raised position, with means for immediate release. The Elmendorf tester determines the force required to propagate a tear along a standardized film specimen, slit according to specifications, at a rapid rate of shear.

The film is held between a stationary clamp and a moveable one carried on the pendulum. The work, in gram-centimetres, done by the pendulum when tearing the specimen is read on a scale on the pendulum, and the force required to tear the film is calculated in grams per mil. of film thickness. Values above 125g./mil. in both directions, and above 150g./mil. in each direction for blown films are considered good.

There are often wide variations of Elmendorf strength, which is basically the resistance to propagation of a tear at high speed, in the machine and the transverse direction, especially for flat film, due to the predominant orientation of the molecules in the machine direction during extrusion.

The Elmendorf strength improves to a certain degree with higher resin density.

(Another question next week)

Polly Ester Says . . .

'Thermosetting — what goes on under the hair dryer'

Makrofol Polycarbonate

ELECTRICAL INSULATING FOIL

By DR HOFMEIER, Farbenfabriken Bayer AG, Leverkusen.

FARBENFABRIKEN BAYER have been engaged in the manufacture of heat resistant electrical insulating foils based on cellulose esters for over 10 years. These foils are well known in industry both in Germany and abroad under the trademark Triafol. Possessing a permanent heat stability up to 120°C. (heat stability class E after VDE 0530) these foils had for a long time the highest heat resistance of all such materials on the market. They are available in the ordinary types Triafol TN (based on cellulose triacetate; stained blue for identification) and Triafol BN (based on a cellulose acetate butyrate; stained violet for identification). The types TW and BW formulated to possess a higher flexibility are marketed for applications requiring foils of higher flexibility. Triafol TW contains a flame retardant plasticizer which even further reduces the original low inflammability of this type.

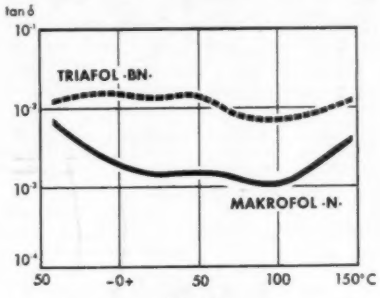


Fig. 1
Tan δ against temperature at 800c/s

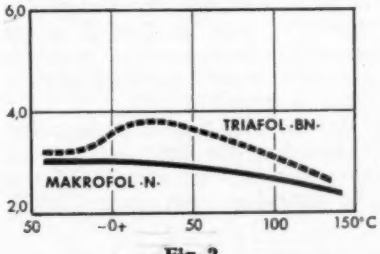


Fig. 2
Permittivity against temperature

This experience in the manufacture of electrical insulating foils proved a valuable asset when about five years ago, with the discovery of the polycarbonates, a new raw material was available for the manufacture of such foils. Polycarbonate based electrical insulating foils appeared on the market within a relatively short time. These foils are also manufactured by the successfully established casting method. Today, they are generally known in industry under the trade mark Makrofol N (stained golden-yellow for identification) and substantial quantities are already currently used both in Germany and abroad. The graphs in figures 1-5 show the progress which this foil represents as compared with Triafol. Further important properties are listed in the table. A remarkable property of Makrofol N but also of Triafol BN and BW is the possibility of forming the foils by deep drawing. Caps, sleeves, and other shapes, can be made in this way. Even very thin foils afford an excellent insulation for magnet cores, coils, etc. They may be destined to replace the lengthy taping process in many cases.

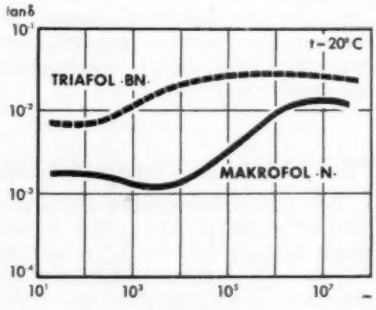


Fig. 3
Tan δ against frequency c/s

Makrofol is resistant to aliphatic hydrocarbons, *e.g.* petrol and transformer oil. Parts of equipment insulated with Makrofol, therefore, permit the use of the majority of the commercial impregnating varnishes. Apart from this, the relatively low resistance to various solvents should be observed when processing the foils. This, on the other hand, offers the great advantage that Makrofol can be cemented with most commercial adhesives. For the bonding of Makrofol to Makrofol, in most cases solvents alone, such as methylene chloride, are sufficient. It is also possible to weld the foil under pressure and heat.

Until recently, insulating foils were manufactured in thicknesses ranging from 0.2-0.02mm. only. The great progress made in dielectric properties gave rise to the desire for thinner foils. A stretching process made it possible to reduce the thickness to 0.01mm.

The stretching process improves the mechanical properties. Fig. 6 shows stress strain curves of Makrofol N and G. The non-stretched foil has been given the name Makrofol N to distinguish it from the stretched foil which is marketed under the name Makrofol G. It should be pointed out that Makrofol G is stretched in longitudinal direction only and the increased mechanical strength exists in this direction only. The mechanical properties in crosswise direction remain unchanged. This orientation offers the advantage that the foil can be shrunk on by means of a short-term heating to 150-160°C., without changing its width. This property is particularly important for the manufacture of wound type capacitors. In connexion with capacitors, it should be pointed out that it is possible to metallize Makrofol under high vacuum. In the case of Makrofol G, however, metallization is only recommended if

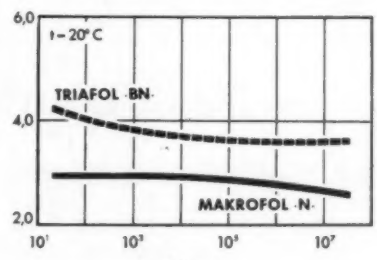


Fig. 4
Permittivity against frequency c/s

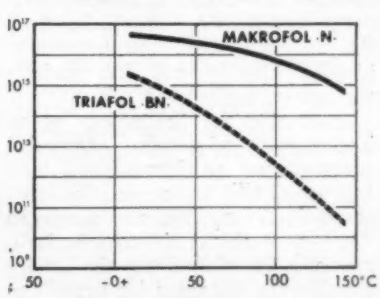


Fig. 5
Volume resistivity against temperature

the foil is not subjected to a shrinking treatment.

Finally, it should be pointed out that all these electrical insulating foils are produced with one side having a matt finish. This offers advantages during winding, particularly on automatic machines.

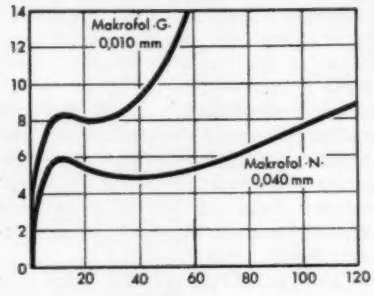


Fig. 6
Stress/strain curves. Tensile strength in kg./mm.² against % elongation

PROPERTIES OF BAYER ELECTRICAL INSULATING FOILS

	Triafol T		Triafol B		Makrofol	
	TN	TW	BN	BW	N	G
Density, g/cc ..	1.27	1.26	1.24	1.23	1.2	1.2
Tensile strength, kg/mm.² ..	8-9	7-8	7-8	5.5-6	8-9	*13-14
Elongation, % ..	20-25	25-30	20-30	35-40	100-120	*50-60
Heat resistance, °C.	120	120	120	120	140	140
Water absorption, 24 hours at 20°C. %	4.0	2.5	3.0	2.0	0.5	0.5
Dielectric strength, kV/mm. ..	120	110	130	125	155	146
Surface resistance, ohm	$>4\times10^{13}$	$>1\times10^{13}$	$>1\times10^{14}$	$>1\times10^{14}$	1×10^{13}	1×10^{13}
Volume resistivity, ohm/cm.:						
Dry	—	—	—	—	$>1\times10^{17}$	$>1\times10^{17}$
4 days at 80% R.H... ..	4×10^{14}	1×10^{15}	1×10^{15}	4×10^{14}	4×10^{16}	—
24 hours water immersion ..	1×10^{12}	1×10^{13}	1×10^{14}	1×10^{14}	3×10^{16}	8×10^{15}
Permittivity:						
50 c/s	4.0	4.3	4.1	3.8	3.1	3.0
800 c/s ..	3.8	4.1	3.6	3.8	3.0	3.0
1 mc/s	3.7	3.6	3.4	3.6	2.9	2.9
Dissipation factor:						
50 c/s	0.014	0.021	0.011	0.007	0.0025	0.0009
800 c/s ..	0.017	0.028	0.015	0.016	0.0020	0.0011
1 mc/s	0.022	0.043	0.024	0.026	0.0087	0.0098

* In longitudinal direction.

New Dunlop Symbol

DUNLOP'S new symbol, recently introduced, has three components: the head of an arrow pointing to the right, a circle within the arrowhead and, in the circle, a forward-leaning 'D.' Dunlop says that together they represent a vigorous, forward-looking, international company.

Prepared by Charles F. Higham Ltd., the symbol was chosen from a large number of designs submitted by advertising agencies and artists in France, Germany and Britain. It will be used, the company says, 'to unify and identify Dunlop and its products throughout the world.'

It is also the centrepiece of an institutional advertising campaign which started on September 1 with half-page and 13in. x 5-column spaces in the national and provincial Press, and which will take in business and financial papers, the literary weeklies and the magazine press. The advertisements feature six aspects of the company's work — research, new materials, employment, production, distribution and sales.

Patent Specifications

Due to pressure on space, this regular feature has had to be held over. It will appear next week.

FBRAM Golf Competition

The rubber federation's golf competition is being held at the Wentworth Club on October 5. It will be followed by an informal subscription dinner at the Club after the day's play.

C. H. M. Baker, a Vice-President of the Federation, will present the prizes.

Entry forms for the competition can be obtained from FBRAM, 43 Bedford Square, W.C.1.

PIGS at Northwood

The Plastics Industry Golfing Society held its meeting at Northwood golf club on August 23.

The 'Airborne' Trophy was won by I. Shindler (34 points); the runner-up was G. Brown — also 34 points, losing on the last six.

R. Smeatham won the visitor's prize with 30 points and the 'Artid' Trophy went to S. H. Brain and F. C. Lyman (36 points). Runners-up were L. F. Bull and G. E. H. Smock (35 points). Visitors' prizes went to Mr Pike and Mr Payne (38 points).

J. A. White

Mr J. A. White, director of Witco Chemical Co. Ltd., died suddenly at his home on August 27. He was 53.

A fluent linguist, he joined Witco twenty years ago and has travelled extensively on the Continent in connexion with the company's manufacturing and sales development of carbon black.

Extremely well known in the European chemical field, he leaves a wife and two sons.

I.C.I. in Eastern Europe

A spokesman for I.C.I. is reported as saying that there is no suggestion that talks with an East European consortium on the sale of polythene know-how were to be resumed soon. (*RJIP* August 27, 300.)

It is believed that the major points — including the price — of a deal have already been agreed and that the discussions now concern details.

Union Oxide Move

Union Oxide and Chemical Co. Ltd. have moved to 6 Eldon Street, London, E.C.2. The new telephone number is Bishopsgate 6741.

Display with a dash. Commercial Plastics turn a roll of Fablon into a dachshund display piece

Plastics Statistics

JULY EXPORTS AND IMPORTS

EXPORTS of plastics materials for July were 12,942 tons valued at £3,218,133 — only slightly higher than the figures for the same month last year (12,198 tons valued at £3,051,924). These figures are given in the official Trade and Navigation accounts, which show that the biggest quantity was taken by Sweden (906 tons), followed by Australia (847 tons), South Africa (615 tons), the Netherlands (612 tons) and India (611).

Imports during the month were 6,714 tons valued at £2,364,180, compared with 5,353 tons and £1,992,286 in July 1959. USA continued to be the major supplier with 2,538 tons, followed by Western Germany with 1,726 tons. Imports for the first seven months of this year now stand at 55,071 tons (£17,431,806)—1959 figure 29,603 (£10,974,768).

Exports for the first seven months of the year amount to 102,271 tons (£26,114,243) — well up on the 1959 figure of 87,359 (£12,134,453).

Details of imports of plastics materials during July, 1960:

	Tons	£
Alkyd solid and liquid resins, solutions, emulsions and dispersions	361	69,560
Cellulose plastics:		
Photographic (including cinematograph) film base (except acetate butyrate)	213	280,703
All other	266	210,527
Polyvinyl chloride:		
Polymers and copolymers	1,858	267,173
All other	470	188,233
All other	3,546	1,347,984
Total	6,714	2,364,180

Exports of plastics materials during July, 1960:

	Tons	£
Acrylic sheet, rod, tube, film, foil and profile shapes in primary form	530	322,399
Alkyd solid and liquid resins, solutions, emulsions and dispersions	460	90,586
Aminoplastics:		
Solid and liquid resins, including solutions	1,111	149,915
Moulding and extrusion compounds	671	121,418
Cellulose plastics:		
Moulding and extrusion compounds	382	118,675
Sheet, rod, tube, film (excluding regenerated cellulose), foil and profile shapes in primary form	155	91,492
Phenolics and cresylics:		
Solid and liquid resins (straight and modified)	524	146,710
Other	478	173,728
Polystyrene	842	174,058
Polythene (polyethylene) sheet, rod, tube, film, foil and profile shapes in primary form	191	69,460
Polyvinyl chloride:		
Polymers and copolymers	1,142	160,926
Moulding and extrusion compounds	930	202,382
Sheet	505	215,302
Other	65	16,640
All other	4,305	1,089,421
Waste and scrap (including celluloid and film waste and scrap)	651	74,571
Total	12,942	3,218,133

UK exports to countries in the European Economic Community (Common Market) and the European Free Trade Association are shown below.

EXPORTS TO EEC

	July 1959	July 1960
Western Germany	403	453
Netherlands	619	612
Belgium	602	463
France	396	603
Italy	532	447
	2,552	2,578

Exports to Commonwealth countries during the month were 4,295 tons (3,881 in June, 1959) and exports to all other foreign countries were 3,285 tons (3,952 tons).

EXPORTS TO EFTA

	July 1959	July 1960
Sweden	454	906
Norway	299	419
Denmark	431	557
Switzerland	243	370
Portugal	257	349
Austria	129	183
	1,813	2,784

British Standards

Silicone-Rubber-Insulated Cables and Flexible Cords

BS 3258:1960, Silicone-Rubber-Insulated Cables and Flexible Cords, has been prepared in view of the increasing use of such cables and cords. It covers a range of these in conductor sizes up to 0.06 sq. in. suitable for a maximum conductor operating temperature of 150°C.

The specification takes the same general form as other British Standards for rubber-insulated cables but is confined to single-core, twin and three-core cables and cords finished either with glass braid and silicone varnish, or with asbestos braid and heat-resisting compound.

The usual tests are included, with an additional heat-cycle test for single-core glass-braided flexible cords only.

Copies of this standard may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London, W.1, price 5s. (Postage is charged extra to non-subscribers.)

Record Year for BSI

The 1959-1960 report of the British Standards Institution, which will be presented at BSI's annual general meeting on September 28, shows that the 12 months to March 31 was a period of record output. 297 new or revised standards were published — more than one for every working day of the week.

One revised and three new standards covering plastics were published during the period under review. On the rubber side two revised and eight new standards were published. Work is in progress on 19 plastics and 14 rubber standards.

Nearly 1,100,000 standard publications were sold, about one-quarter of which went overseas. The number of subscribing members was also at a peak figure of over 11,000.

The record of 'work-in-hand' makes it clear that BSI's range of activities is becoming ever more extensive and suggests that in the coming year or two the output of standards will be at least as high as in the year under review. The report strikes a warning note, however. As BSI's burden becomes heavier 'an accelerated rise in subscriptions and income generally will be necessary if BSI is to carry out its basic work with proper efficiency and if it is to continue and extend the essential related services of promoting the application of standards, helping in education and providing publicity, especially overseas.'

Handbags in USA are being woven of bands made by extruding Tenite butyrate over metal foil. The bands are being extruded in gold, silver and coloured effects.

Now on Sale

Engineering Design with Rubber

The Properties, Testing, and Design of Rubber as an Engineering Material.

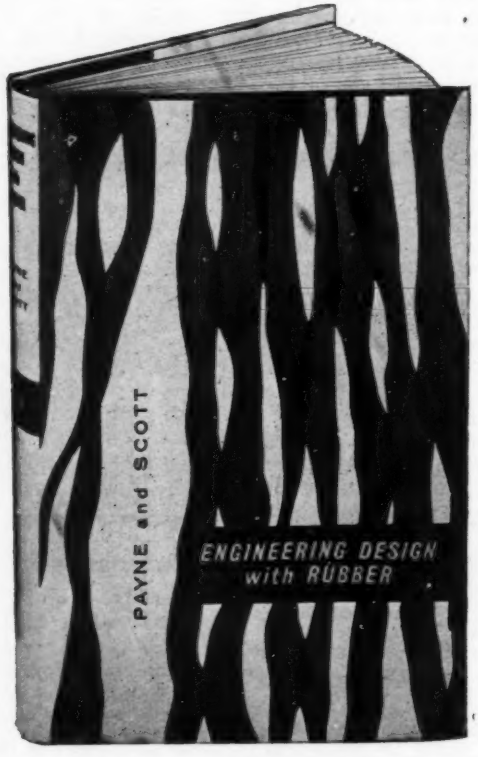
by

A. R. PAYNE, B.Sc., A.Inst.P., A.I.R.I.

and

J. R. SCOTT, Ph.D., M.Sc., F.R.I.C., F.Inst.P., F.I.R.I.

R.A.B.R.M. MANUAL No. 4



The First theoretical examination of an increasingly important subject to appear in book form, it has also been designed to be a practical manual for engineers and rubber technologists faced with problems in rubber engineering design.

Orders to:—
Rubber Journal and International Plastics Book Department, Maclaren House, 131 Great Suffolk Street, London, S.E.1

U.S.A. and Canada:—
Interscience Publishers Inc., New York

PRICE

50/-

(By Post 52/-)

Prospectus on request

Rubber Statistics

USA—SWITZERLAND—CANADA

THE United States Rubber Manufacturers' Association reports that total consumption of new rubber in July amounted to 115,070 tons against 138,425 in June.

Consumption in July comprised 35,085 tons of natural rubber and 79,985 tons of synthetic rubber (including 68,140 tons of SBR).

June consumption (all June figures here are revised figures) comprised 42,576 tons of natural and 95,849 tons of synthetic (including 75,920 tons of SBR).

Total synthetic rubber production in July was 116,759 tons against 122,547 tons in June, while production of SBR alone was 95,700 tons against 98,635 tons in June.

Total synthetic rubber exports in July were 26,275 tons against 29,355 tons in June.

Switzerland

Swiss rubber imports in July totalled 1,557,327 kilos, compared with 1,547,756 in June, according to the Swiss Customs Directorate.

Details are (in kilos):

	July	June
Raw rubber	605,708	660,205
Synthetic rubber ...	814,582	762,143
Regenerated rubber	2,300	17,500
Scrap rubber	134,737	107,908

Main sources of raw rubber were Malaya, with 481,554 kilos, Thailand, with 51,030 kilos, Indonesia, with 40,505 kilos, and Vietnam with 30,112 kilos.

Main suppliers of synthetic were the US with 593,099 kilos, Canada with 147,891 kilos, West Germany with 35,252 kilos, France with 20,190 kilos, and Holland with 16,803 kilos.

The entire regenerated rubber imported in July came from Italy. Of the scrap rubber, West Germany delivered 117,654 kilos and France 16,710 kilos.

Canada

Consumption of rubber (natural, synthetic and reclaimed) in Canada in June fell to 9,676 long tons from 11,448 in the same month in 1959. This placed the January-June total at 57,128 long tons, a decrease of 7.2% from the year-earlier figure of 61,561 long tons.

Consumption of all types of rubber was smaller in June and the half-year period this year than last. Month's totals were: natural, 3,243 long tons (4,203 a year earlier); synthetic, 4,953 (5,549); and reclaimed, 1,480 (1,696).

Half-year totals: natural, 19,272 long tons (22,297 in the first half of 1959); synthetic, 28,824 (29,940); and reclaimed, 9,032 (9,324).

Butyl Rubber Symposium

As previously reported, the National College of Rubber Technology is to hold a symposium on butyl rubber at the college on September 22 and 23 (*RJIP* August 20, 261).

The full lecture programme has now been released. After an opening defining the present status of butyl rubber, other lectures will be: 'The Relation between Structure and Properties of Butyl Polymers' (R. L. Zapp, Esso); 'The Development of Faster-curing Butyl Rubbers' (J. Walker, Polymer (U.K.)); 'Chlorobutyl and Butyl Latex' (P. E. C. Davies, Esso); 'The Significance and Effect of Heat Treatment on Butyl Rubber' (A. G. Strong, Esso); 'Compounding for Electrical Applications' (A. G. Strong, Esso); 'Resin Curing of Butyl Rubber' (M. E. Blouin, Polymer (U.K.)); 'Compounding for Heat and Chemical Resistance' (P. E. C. Davies, Esso); 'Weathering of Light Coloured Butyl Vulcanizates' (J. Walker, Polymer (U.K.)); 'The Effect of Compounding on the Ozone Resistance' (K. Pickard, Polymer, (U.K.)); 'Dynamic Properties of Butyl Rubber' (R. L. Zapp); 'Experiences with Butyl Rubber in Conveyor Belts and as a Chemical Plant Lining' (L. T. Butt, I.C.I.); and 'Butyl for Tyres' (R. L. Zapp).

A general discussion is planned for the end of the second day.

A course for packaging buyers will be held at the Connaught Rooms, London, W.C.2, from February 14-15. It has been arranged by the Purchasing Officers Association.

Book Review

STABILIZATION OF FREE RADICALS AT LOW TEMPERATURES — SUMMARY OF THE NBS PROGRAM. — Edited by A. M. Bass and H. P. Broida, US National Bureau of Standards Monograph 12. (110 pp., 15s.)

The basis for this volume is a collection of seven papers presented at the fourth international symposium on free radical stabilization in Washington, August 31 through September 2 1959. The first paper describes the general technical management of the programme. This is significant in that the programme was based on the belief that maximum productivity would be achieved by a group of competent senior scientists, drawn from government, industry, and educational institutions, provided with adequate research facilities, having the freedom to choose their own research activities, and being relieved of administrative responsibilities.

The remaining papers deal with the technical aspects of trapping, storing, and studying free radicals at extremely low temperatures. Also included are a cross-referenced bibliography of papers published as a result of research completed during the three-year research programme, and a summary account of the 1959 Symposium.

Papers included in the publication are: 'Qualitative comments on the physical and chemical processes in trapped radical systems'; 'Experimental aspects of the NBS Free Radicals Program'; 'A survey of theoretical work on trapped radicals at NBS'; 'Low-temperature chemistry'; 'Methods of production of trapped radicals and properties of radical-trapping solids'; 'Identity and concentrations of trapped radicals'; and 'Interactions between trapped species and the matrix.'

∴ Copies may be ordered through the Books Department, RUBBER JOURNAL AND INTERNATIONAL PLASTICS, Maclaren House, 131 Great Suffolk Street, London, S.E.1.

A new type of bath loofah is now being produced by Polymer Threads Ltd., of Chesham. Called the 'Polyloofa' it consists of a core of flexible polyurethane foam which is covered with layers of mesh made from BRP's Rigidex high density polythene. The sponge section provides a good lather and the Rigidex mesh produces a stimulating friction effect

Rubber Markets

LONDON

The rubber market was displaying a sounder undertone during the past week, with prices fluctuating modestly around previous levels. Although consumer demand showed little improvement and stocks remained heavy, liquidation and up-country selling was easing off at origin, and some dealers were inclined to 'cover-in' recent short sales.

Latest prices are as follows:
No. 1 RSS Spot: 28⅜d.-28⅝d.
Settlement House:
October 28¼d.-28⅜d.
November 28¼d.-28⅜d.
December 28⅜d.-28⅝d.
October/December 28¼d.-28⅜d.
January/March 28⅛d.-28⅜d.
April/June 27⅞d.-28⅛d.
July/September 27⅝d.-27⅞d.
No. 1 RSS cif basis ports:
September 28⅜d.-28⅝d.
October 28⅜d.-28⅝d.
Godown:
September 97¼ Straits cents nominal.

LATEX

Centrifuged 60% latex per gallon in drums, seller, September, October, 16s. 4d., cif European ports. Spot, seller, 16s. 11d. Bulk, nominal, d.w. 16s. 3d. nominal, August. Creamed, seller, 15s. 11d. nominal, September, October. Normal, seller, September, October, 14s.

BANGKOK

No. 1 RSS

The price of No. 1 RSS at Bangkok on August 29 was 31.00 (31.37½) US cents per lb.

SINGAPORE

Very quiet conditions prevailed in the morning of August 29 but prices advanced on lack of sellers. Lower sheets were neglected and factories were quiet. Buying continued in the afternoon but the turnover was restricted owing to lack of sellers. Interest in lower sheets continued negligible. After hours, the market was quiet but steady.

Malayan cents per lb., fob Malayan ports to open ports

	Aug. 29	Prev. Close
No. 1 RSS, Sept.	97¼– 97½	95½– 95⅞
Oct.	97⅛– 97¼	96⅛– 96⅜
No. 2 RSS, Sept.	96½– 97	95½– 95⅞
No. 3 RSS, Sept.	95⅞– 96⅛	94⅝– 95⅛
No. 4 RSS, Sept.	94⅝– 95⅛	93 – 93¼
No. 5 RSS, Sept.	91⅛– 92⅛	90 – 91
No. 1 RSS, Spot	97⅛– 97⅜	95⅝– 96⅛
No. 3 blanket, thick remilled, Sept. ..	85½– 86⅛	84 – 85
No. 1 fine pale crepe, Sept. ..	106½–107¼	105 –106
2x thin brown crepe, Sept. ..	85½– 86⅛	84½– 85⅛

Tone: Quiet.

The industries syndicate quote latex, native produce, 60% centrifugal, packed in rectangular drums, fob at 176.40d. per gallon.

CEYLON

No. 1 RSS

The price of No. 1 RSS at Colombo on August 29 was 104½ (102) Ceylon cents per lb.

NEW YORK

The New York rubber market ruled as under on August 29:

DEALERS' PRICES

US cents per lb., ex-dock

	Aug. 29	Previous
No. 1 RSS, Sept. ..	34⅝n	34⅛a
Oct. ..	34n	34a
No. 2 RSS, Sept. ..	34⅛n	34⅛a
Oct. ..	33⅞n	33⅞a
No. 3 RSS, Sept. ..	34⅛n	34⅛a
Oct. ..	33⅞n	33⅞a
No. 1 RSS, Spot ..	35⅛n	36⅛t
No. 3 amber blanket crepe, Sept.	28⅛n	28⅛a

FUTURES—REX CONTRACT

	August 29	Prev. Close
Sept. ..	35.55b–35.70a	36.10t
Nov. ..	33.85b–33.95a	33.75t
Jan. ..	32.99b–33.10a	32.75t
March ..	32.50b–32.65a	32.25b–32.40a
May ..	32.25b–32.45a	32.00b–32.20a
July ..	32.00b–32.20a	31.80b–32.00a
Sept. ..	31.75b–32.00a	31.60b–31.75a

Sales: 30. Tone: Barely steady.

Rubber futures were firmer in early dealings on August 29 following the advance at Singapore but declined later on light profit-taking. Dealings were slight. Traders said lack of factory buying in the physical market contributed to the selling later in the session. Futures were barely steady in late dealings.

AMSTERDAM

The Amsterdam rubber market ruled as under on August 29:

Guilders per kilo

No. 1 RMA	Aug. 29	Previous
August	Deleted	2.75
September ..	2.75	2.75
October	2.74	2.74
November ..	2.73	2.73
December ..	2.72	2.72
Oct./Dec. ..	2.73	2.73

Sales: Nil. Tendency: Quiet.

DJAKARTA

No transactions were reported on August 29. Both buyers and sellers were reluctant to trade, pending further overseas market developments. The market closed very quiet.

Rupiahs per kilo

	Aug. 29	Previous
Spot No. 1 Priok ..	34.50n	36.00b
Spot No. 2 Priok ..	33.50n	35.00b
Spot No. 3 Priok ..	31.00n	33.00b
No. 1 fine pale crepe, spot	33.00n	35.00b

Tone: Very quiet.

Demonstration in Greece

There will be a plastics display at the 25th International Fair of Thessaloniki in Greece. The fair will be held in Salonika, September 2-25.

Extruded butyrate sheet provided by Eastman Chemical Products will be vacuum formed into 6½in.-diameter containers in a demonstration as part of United Estates exhibit.

South Wales Branch

A branch sales office has now been added to Michelin's Cardiff depot. It will deal with customers in Glamorgan, Brecknock, Monmouth, Carmarthen, Pembroke and Cardigan. W. B. Anthony is the divisional sales manager, O. J. B. Llewellyn the branch office manager and W. A. Grittiths depot manager. The address is Garth Street, Adamsdown, Cardiff.

Canadian Prices Up

Prices of all passenger car tyres have been boosted 2.5% by Goodyear of Canada.

This move by Goodyear follows recent company price increases in industrial belting and hose of 5% and in truck tyres of 10%.

ISR Expand

The International Synthetic Rubber Co.'s Hythe capacity — now 80,000 tons — will be stepped up to 90,000 tons by the end of this year with the completion of new plant.

I.C.I. Get Polypropylene Fibre Licence

I.C.I. have signed a patent licence agreement with Montecatini of Milan for the exclusive UK production of polypropylene staple fibres, filament yarns and textile monofilaments.

Company in the News

Albright and Wilson

Albright and Wilson is raising the interim dividend from the equivalent of 4.8% to 6% for 1960, allowing for the one-for-four scrip issue.

Compared with a year ago the interim is also payable on a capital increased by shares issued in exchange for those acquired in A. Boake Roberts and Co. (Holding).

Group trading profits, unaudited, for the six months to June 30 1960, including those of Boake Roberts for that period, totalled £3,962,000. Corresponding figures were £3,545,000 for the group as then constructed and £3,806,000 including those of Boake Roberts.

Industry INTELLIGENCE

Technical Data

Rustproofing Coating

A new coating product has recently been introduced by Metalife Liquid Metals Ltd., Harrogate. This is known as Metalife Duplex metal coating and is a two pack system consisting of a base and solidifier which when combined give a metal coating with good resistance to corrosion, abrasion and chemicals which will withstand temperatures from −65° to 400°F. dry heat.

The coating may be applied by brush to give a thick coat which is air drying, and may be painted over in six hours. An additional advantage of the material is that it may be used on damp surfaces — an important consideration for open site work — and it does not sag, drip or run when being applied.

Synpol for Treads

Synpol application bulletin No. 1 issued by Texas - US Chemical Company, is entitled 'Current Trends in Compounding Synpols for Tread Rubber.' This gives details of compounds, compounding and mixing, carbon blacks and carbon black masterbatches. A comparison is made between dry blends and black masterbatches with regard to tread wear, curing systems are discussed and the addition of various miscellaneous additives is considered.

In addition to tread rubber for passenger tyres, large quantities of tread rubber are produced for truck tyres, off-the-road tyres and aircraft tyres. SBR is used extensively for these applications particularly for smaller sizes of heavy duty truck tyres.

Vybak Monofilaments

Advance Information Sheet S.10 issued by Bakelite Ltd., 12-18 Grosvenor Gardens, London, S.W.1, introduces additions to the Bakelite range of PVC monofilaments. These are Vybak monofilaments DBA.303 which have been specially developed to meet the demand for a medium price synthetic filling suitable for flagging. The filaments are supplied single or double flagged or un-flagged and the grade references are as follows: Un-flagged DBA.303, single flagged DBA.304, double flagged DBA.305.

These filaments have good resistance to matting and excellent recovery and are suitable for fillings for soft household brushes, but are not recommended for use where an unflagged filament is required, or where temperatures are likely to exceed 60°C.

SBR Floor Tiles

Synpol Application Bulletin No. 2 issued by Texas-US Chemical Co., 260 Madison Avenue, N.Y. 16, relates to the improvement in cost and quality of SBR floor tiles to be obtained by the use of the light coloured, cold, oil-extended Synpols 8200 and 8202, which have low polymer cost, good colour and mechanical properties. Combinations of these with high styrene Synpols 1013 and 8000, retain most of the cost savings of the oil-extended polymers while improving the mechanical and colour characteristics of the tile. Included in the bulletin are five pages of tests results showing the effect of loading, polymer type and accelerators, on tile properties and a comparison of the colour stability of light coloured Synpols.

Machines, Materials and Equipment

Factory Planning Service

Substantial reductions in the heavy starting-up costs of new building operations, which in recent years have often been as high as the operations themselves, are a feature of a new service introduced by Personnel Administration Ltd., the management consultants.

By expanding and co-ordinating their existing range of techniques available to management, PA are now providing their clients with a comprehensive service covering all aspects of the planning and installation of a new project. This covers an initial detailed study to determine the precise requirements of the project through to its completion and subsequent operation.

It entails, where appropriate, advice on the different methods of financing the project; research into marketing; the evaluation of alternative lines of action so as to obtain the most favourable return on investment; the design and development of the most suitable lay-out; and an analysis of material handling requirements. It further includes the co-ordination of the specialists involved, such as architects, quantity surveyors and contractors; the programming of building operations and plant installation; and the selection, training and development of staff.

The aims of the service are to ensure that by careful planning and control throughout all stages both a client's initial expenditure and subsequent operating costs are reduced. Enquiries should be addressed to: Factory Planning Division, Personnel Administration Ltd., 2 Albert Gate, Knightsbridge, London, S.W.1.

Publications

Dodecenyl Succinic Anhydride

A new technical bulletin outlining the physical and chemical properties as well as the suggested uses for dodecenyl succinic anhydride has been published by Allied Chemical International of New York.

The chemical compound contributes unusual properties to epoxy resins when used as a curing agent and to rubber when employed as a compounding material. It is easily handled and blends readily with both liquid and solids.

It yields hard but more flexible castings with epoxy resins and the cured products are said to have excellent electrical properties and flexural strength.

The compound can also be used as an intermediate for plasticizers.

Transparent Rubber

Hi-sil Bulletin No. 21 issued by Columbia-Southern Chemical Corporation, Pittsburgh 22, PA, entitled 'Some Additional Notes on Compounding Transparent Rubber,' is a reprint of an article by Ralph F. Wolf and C. C. Stueber, which appeared in *Rubber Age*. This article deals with the improvements made in the transparency of vulcanized elastomers filled with reinforcing silica since the publication of an earlier work by one of the authors. One aspect which is of importance is the fact that very satisfactory transparency can now be obtained in silica-filled butyl rubber compounds. The transparency of the best natural rubber compounds reported previously has been further enhanced by the use of additives which eliminate the opacity introduced by the zinc oxide needed for accelerator activation.

Carbon Black Abstracts

The latest volume of Carbon Black Abstracts to be issued by the research laboratories of Godfrey L. Cabot, Inc., Boston 10, Massachusetts, is Vol. 9, No. 2, and covers the period April-June 1960.

This follows the same pattern as previous issues and is in four sections, production and processing, applications, fundamental properties, and economics, statistics and news of the industry. The applications section is further subdivided into rubber blacks, natural rubber, carbon black in plastics and synthetic resins, colour blacks, electrical applications of finely divided carbon and miscellaneous uses of finely divided carbon.

Synthetic Rubber Prices

Prices of synthetic rubbers appear regularly in Rubber Journal and International Plastics *in the first week of each month. It will be appreciated if suppliers will give notification of any price changes or additions to their range. Cif duty paid quotations are subject to slight variation due to exchange, ocean freight and insurance fluctuations. Prices are in pence per lb., except where otherwise stated. Grades are expressed as follows:* 1001/2/6 = *grades* 1001, 1002 *and* 1006.

(e-qdp)—Ex-quay duty paid (cifUKdp)—cif UK duty paid (e-i)—Ex-installation (ddp)—Delivered duty paid (e-sUK)—Ex-store UK (ex-wUK)—Ex-warehouse UK (d)—Delivered BM—black masterbatch CBM—cold, black masterbatch CNP—cold, non-pigmented CNS—cold, non-staining COE—cold, oil extended COELC—cold, oil extended, light coloured CO/BM—cold, oil/black masterbatch CPOE—cold, pigmented, oil extended CRE—cold, rosin extended dw—Dry weight HN—high nitrile HNP—high nitrile, powder HP—hot, pigmented HS—high styrene HMW—high mol. wt. LMW—low mol. wt. MHN—medium high nitrile MLN—medium low nitrile MMW—medium molecular weight MN—medium nitrile NS—non-staining TS—total solids RTV—room temp. vulc.

SBR TYPES AND HIGH-STYRENE RUBBER

Ameripol (Goodrich Gulf) (e-qdp)
(min., 70,000-lb. lots)

1000/1	Hot, Non-Oil	23.1
1002/6/7	,, ,,	23.34
1009/11	,, ,,	23.71
1012	,, ,,	23.24
1013	,, ,,	23.94
1500/1/2	Cold, Non-Oil	23.1
1703	COE, 25% Oil	*20.31
1705	,, ,,	*20.07
1707/8	,, 37.5% Oil	*18.89
1710/12	,, ,,	*18.66

*Under 70,000 lb., min. 600 lb.

ASRC (American Synthetic Rubber Corpn.) (cifUKdp*)
(carloads lots of 30,000 lb.)

1000/1/4/6	Hot, Non-Oil	23.99
1009	,, ,,	24.61
1018	,, ,,	26.74
1019	,, ,,	26.26
1500/2	Cold, Non-Oil	23.99
1503	,, ,,	26.02
3110	,, ,,	25.78
1703	COE	20.69
1708	,,	19.27

*US/£ conversion rate $2.80

Cariflex (Shell Chemical) (e-sUK)

S-1000	Hot	22.25
S-1002	,,	23.375
S-1006	,,	22.25
S-1009/11/13	,,	24.0
S-1100	Hot/black	19.75
S-1500/2/9	Cold	22.25
S-1600/2	Cold/black	19.625
S-1605	,, ,,	19.375
S-1703	COE	20.25
S-1707	,,	18.0
S-1709/12	,,	17.75
S-1803	COBM	17.875

FR-S (Firestone) (esUKdp*)

1000/1/4/6/7	Hot	22.25
1500/2	Cold	22.25
146	,,	22.25
1710/12	OE	17.75
184	,,	17.75
178	,,	18.0
1009	cifUK Specialty	24.75
1010	,, ,,	26.0
1012	,, ,,	24.25
1013	,, ,,	25.0
1014	,, ,,	28.125
1015	,, ,,	28.75
141	,, ,,	28.625
181	,, ,,	24.125
182	,, ,,	25.0
158	,, ,,	29.5

*US/£ conversion rate $2.80

Int. Synthetic Rubber (d)

Intol 1500/2	22.5
Intol 1509	22.5
Intol 1570	22.5
Intol 1006	22.5
Intol 1710	18.0
Intol 1712	18.0
Intol 1778	18.25

Naugapol (Naugatuck Chemical) (e-sUK)

1016	28.0
1018	28.5
1019	28.0
1022	30.75
1023	32.75
1503	27.75
1504	34.0
6101	26.25
6102	27.75
K-45	30.5
K-50	31.25
KO-50	29.0

ANIC (cif UK dp)

1500	22.25
1502	22.25
1708	18.00
1712	17.75

Philprene (Phillips) (e-qdp*)

1000/1/6	Hot, Non-Pig	23.28
1009	,, ,,	24.69
1010	,, ,,	25.86
1018	,, ,,	26.80
1019	,, ,,	26.33
1100	HP	19.65
1104	,,	19.28
1500/2	CNP	23.28
1503	,,	26.1
1601	CP	19.56
1605	,,	19.28
1703	COE	20.23
1706	,,	19.94
1708	,,	18.82
1712	,,	18.58
1803	CPOE	17.78
1805	,,	15.99

*US/£ conversion rate $2.81¼

Plioflex (Goodyear) (ex-wUK)

1006	HNP	22.25
1500/2/7/8	CNP	22.25
1006	S	22.75
1703	COE	19.25
1710/12	,,	17.75
1773	COELC	19.25
1778	,,	18.0
B—6		27.5
B—5		28.0

Polysar (Polymer UK) (e-sUK)

S Hot		22.25
S-630 Hot		22.25
Kryflex 200 Cold		23.5
Krylene		22.25
Krylene NS		22.25
Krylene 602 Cold		22.25
Krynol 651 COE		17.75
Krynol 652	,,	18.0
S-X 371 Process Aid		24.0

Synpol (Texas-US Chemical) (e-qdp)

1000/1	Hot	22.25
1002	,,	22.47
1006/7	,,	22.25
1009	,,	22.81
1012	,,	22.38
1013/61	,,	22.25
X274	,,	23.45
8000	,,	22.25
1500/02/51	Cold	22.25
1703	COE	19.25
1707/8	,,	18.0
1711	,,	17.88
1712	,,	17.75
8200	,,	18.0
8201	,,	16.6
8202	,,	16.38
8152	CBM	18.6
8151	COBM	18.2
8253	,,	15.84
8254	,,	15.45
8255	,,	14.8
8267	,,	16.4

(Masterbatch prices US cents per lb. fas Gulf ports)

SBR LATICES

Copo (Copolymer) (cifUKdp)
(10-ton lots)

2101	(dw)	46.3
X-765	,,	40.8
X-800	,,	37.2
2102/5	,,	38.0

Pliolite Rubber (Goodyear) (d)

2000	40

Latex (dw)

2001/4/5/8	40
5350	40

Pliolite Resin (Goodyear) (d)

101A (dw)	44
150 ,,	50
151 ,,	35
160 ,,	50
170 ,,	50

Hycar (B. F. Goodrich) (ddp)

2507 (HS) dw	48

Polysar (Polymer UK) (e-sUK)

Latex, type IV	32.5 TS
Latex, type 722	31.75 TS
(Non-returnable 45-gallon drums)	(e-i)
Latex, type 722 (bulk quantities)	28.75 TS

Int. Synthetic Rubber (ex-wks)

Intol Latex M23B/R23/F28	22.25
Intol Latex 62A	27.0

Dylex (Koppers Int. CA) (fas)

K-42A/52/31/900	31.6

ACRYLONITRILE TYPES

Butaprene N (Firestone) (cifUKdp)

NL	52.5
NAA	56.25
NF	51.5
NXM	60.18

Chemigum (e-s)

N—1	75
N—3A	52
N—5	52
N—6G/7/8/600X	45

Hycar (British Geon) (UKd)
(500-lb. lots and over)

1001	High Nitrile Hot	52
1041	,, ,, Cold	52
1002	MHN Hot	45
1042	,, Cold	45

Hycar (B. F. Goodrich) (ddp)
(500-lb. lots and over)

1411	HNP	66
1432	MHN (crumb)	64
1072	,, (carboxyl)	66
1312	,, (liquid)	55
1043	MLN	51
1014	Low Nitrile	61

I.C.I. (min., 5-cwt. lots) (UKd)

Butakon A-4051 HN Cold	52
Butakon A-3051 MN Cold	45
Butakon A-3002 ,, ,,	45

Paracril (US Rubber) (dwe-sUK)

18-80	Low Nitrile	61
AJ	,, ,,	50
B	MLN	51
BJ	,,	51
BLT	,, Cold	51
BJLT	,, ,,	51
C	MHN	59
CLT	,, Cold	59
CV	,, (crumb)	63
D	High Nitrile	67
ALT		51
OZO		47

Polysar (Polymer UK) (d)

Krynac 800 MN	45
Krynac 802 LN	45
Krynac 803 MN (low Mooney)	45
Krynac 801 HN	52
Krynac 804 (MN-cross linked)	45

ACRYLONITRILE LATICES

Buta prene N (Firestone) (cifUKdp)

N-300 (dw)	53
N-400 ,,	60.5

Chemigum Latex (Goodyear) (d)

200	(dw)	65
235/6	CHS ,,	60
245	B ,,	52
245/6/7/8	CHS ,,	52

Hycar (B.F. Goodrich) (ddp)
(dry weight, drum lots)

1551 High Nitrile	66
1552 MHN	57

Hycar (British Geon) (UKd)
(dry weight, 3 drums and over)

1561	High Nitrile	60
1571	,, ,, (carboxyl)	60
1562	MHN	52
1577	,, (modified)	52

ACRYLIC TYPES

Hycar (B. F. Goodrich) (ddp)

4021 Slab, 500 lb. and over	144
4501 Latex, dry weight	96

BUTYL TYPES

Esso (e-sUK)

Regular 035/150/215	21.75
Regular 217/8	21.75
Regular 325	21.75
Non-staining 065	22.75
Non-staining 165	22.75
Non-staining 265/7/8	22.75
Non-staining 365	22.75

Vistanex (Polyisobutylene) (e-qdp)

MS	LMW	54
MH	,,	54
L-80	MMW	54
L-100	,,	54
L-120	,,	54
L-140	,,	54

Polysar (Polymer UK) (e-sUK)

Butyl 100/200/300		21.75
Butyl 301/400	NS	21.75
Butyl 101	NS	26.25
Butyl 402	NS	22.5

Hycar (B. F. Goodrich) (ddp)
(500 lb. and over)

2202 Brominated	68

NEOPRENES

(ddp)

W and WHV	(dwdel)	42.62
WRT	,,	48.37
WX/GN/GNA	,,	44.62
GRT and S	,,	45.62
AC	,,	57.125
KNR	,,	75.62
AC 'M' and 'S'	,,	57.125
CG/AD	,,	57.125

Latices—Dry
(per lb. del, min., 50 lb.)

571	49.75
842A	49.75
572	51.25
601A	51.87
650	54.125
735	51.25
736	51.25
950	58.25
60	51.87
750	51.25
635	53.62

SILICONE RUBBERS

Midland Silicones
(500-lb. lots del)

Stocks	16s. 6d. to 35s.
Pastes	26s. to 35s.
Gums and base stock	36s. to 42s.
Cold-curing silicone rubber	20s. and 23d. 6d.

I.C.I. Silicones

Gums (40-lb. lots del) 39s. 6d.-47s.
Stocks (250-lb. lots del) 22s.-35s.
Pastes (1000-lb. lots del) 27s.6d.-35s.9d.
Silcoset (RTV) (250-lb. lots del) 21s. to 24s.

REINFORCING RESINS AND RUBBERS

I.C.I. (min., 2-ton lots) (UKd)

Butakon S-8551	36.5
Butakon S-7001	33.5

Hycar (B.F. Goodrich) (ddp)

2007 (powder)	42.5

Pliolite (Goodyear) (d)

S—6B	36.5

Polysar (Polymer UK) (e-sUK)

SS-250 HS (bale)	27.25
SS-250 ,, (flake)	27.5
Kryflex 252 HS	25.5
Kryflex 202 (HMW Cold polymerized)	25.75

Cariflex (Shell) (e-sUK)

SP-103	28.0

Cyclite (Durham Raw Materials) 42

HYPALON

(ddp)

20	48
30	60.25
40	50.75

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

(795,733) Boats made wholly or principally of rubber or of artificial rubber. The Avon India Rubber Co. Ltd., 'Avon' India Rubber Works, Melksham, Wiltshire. (Class 12; July 12 1960).

KANGAROO (794,513) Continuous lengths of preformed bags made of plastics for use in wrapping and packaging. Aktiebolaget Celloplast, Hospitalsgatan 70, Norrköping, Sweden. Address for service is c/o J. E. Evans-Jackson and Co., 49 Albert Hall Mansions, Kensington Gore, London, S.W.7. (Class 16; July 12 1960).

PARAGON kariabox

(795,393) Containers included in Class 16 made wholly or partly of paper, cardboard or of plastics, and being in the nature of boxes. Lamson Paragon Ltd., Paragon Works, Canning Town, London, E.16. (Class 16; July 12 1960).

VYON (800,479) Plastics and articles made therefrom, all included in Class 17. Pritchett and Gold and E.P.S. Co. Ltd., Dagenham Dock, Essex. (Class 17; July 12 1960).

FABRON (786,876). All goods included in Class 19 made wholly of plastics, but not including non-metallic flooring materials or shaped and perforated sections. Commercial Plastics Limited, Willington Quay, Wallsend - on - Tyne, Northumberland. (Class 19; July 12 1960).

FADEMAC FLOORFLEX (798,471) Flooring tiles made of asbestos bound with vinylic resins Société Anonyme Pour La Fabrication De Materiaux De Construction 'Fademac' 19 Rue des Deux Eglises, Brussels, Belgium. Address for service is c/o Reginald W. Barker and Co., 13 Charterhouse Square, London, E.C.1. (Class 19; July 12 1960).

DeHOXITE (797,427) Synthetic resins; accelerators and curing agents (all being chemical substances) for synthetic resins; and metallic oxides (not being colouring matters) in water-insoluble ceramic powder and in crystalline or granule form. De Havilland Propellers Ltd., Manor Road, Hatfield, Hertfordshire. (Class 1; July 19 1960).

REDSHANK (802,872) Boats. The Avon India Rubber Co. Ltd., 'Avon' India Rubber Works, Melksham, Wiltshire. (Class 12; July 19 1960).

REDSTART (802,873) Boats. The Avon India Rubber Co. Ltd., 'Avon' India Rubber Works, Melksham, Wiltshire. (Class 12; July 19 1960).

(795,070) Pipe and cable clips and pipe and cable cleats, all made of plastics; and material included in Class 17 in the form of sheets, rods, tubes, blocks, strips and shaped sections, being goods made wholly of plastics or of rubber. Howard Clayton-Wright Ltd., Wellesbourne House, Wellesbourne, County of Warwick. (Class 17; July 19 1960).

LANCHAM (789,982) Materials (non-textile) made of bonded synthetic fibres or of bonded mixtures of synthetic and natural fibres, the synthetic fibres predominating, all for use in manufactures and sold in the piece; and articles made therefrom; all being goods included in Class 17. Lansil Ltd., Caton Road, Lancaster. (Class 17; July 19 1960).

SYNOL ADHESIVE FOAM (797,256) Foamed polyurethane plastics in sheet form with an adhesive surface for use in the manufacture of chiropodial pads. The Scholl Mfg. Co. Ltd., 182-204 St. John Street, London, E.C.1. (Class 17; July 19 1960).

SAROLENE (803,834) Imitation leather; and articles made therefrom included in Class 18. Saro Products Ltd., Folly Works, Whippingham, East Cowes, Isle of Wight. (Class 18; July 19 1960).

PATENT LIST

Printed copies of the Specifications in the following list, published by permission of the Controller of H.M. Stationery Office, can be obtained from the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d., including postage.

COMPLETE SPECIFICATIONS ACCEPTED

Open to public inspection on August 10 1960

Twentieth Century (Joinery & Packing) Co. Ltd. Plastic-bonded fibrous packing material. 844,362.

Semtex Ltd. Production of rubber composition sheet material. 843,763.

Submarine Cables Ltd. Moulding of thermoplastic materials. 844,052.

Wacker-Chimie G.m.b.H. Apparatus for granulating plastic masses. 844,057.

Phillips Petroleum Co. Process and apparatus for producing carbon black. 843,786.

O. W. Burke. Compounding of vulcanizable elastomers. 844,164.

Farbwerke Hoechst Aktiengesellschaft Vorm. Meister Lucius, and Brüning. Process for the manufacture of diphenyl ethers. 843,695.

Imperial Chemical Industries Ltd. Polymer compositions. 843,697.

Imperial Chemical Industries Ltd. Manufacture of polymeric materials. 844,525.

Farbwerke Hoechst Aktiengesellschaft Vorm. Meister Lucius, and Brüning. Process for the manufacture of pigmented particles of high melting polyesters. 844,286.

Celanese Corporation of America. Polymers. 843,825.

Farbwerke Hoechst Aktiengesellschaft Vorm. Meister Lucius, and Brüning. Process for the polymerization of unsaturated polymerizable compounds. 843,700.

K. Krebs. Injection-moulding machines for synthetic thermoplastic substances. 843,826.

Farbenfabriken Bayer A.G. Process for the manufacture of plastics. 843,703.

Fabbrica Milanese Conduttori S.p.A. Process and apparatus for covering wires with plastic material in two or more helically arranged colours and wire when so covered. 843,958.

Everlastic Ltd. Brassiere. 844,064.

Pneumatiques Dunlop S.A. Des, and N. Nebout. Process and apparatus for the continuous production of flexible webs. 844,536.

Goodyear Tire & Rubber Co. Synergistic mixtures of antioxidants for natural and synthetic rubber. 843,853.

Kalle & Co. A.G. Polymerization of acrylic compounds. 843,854.

Farbenfabriken Bayer A.G. Process for the production of elastic plastics of high molecular weight. 843,704.

De Bataafsche Petroleum Maat-Schappij N.V. Process for preparing copolymers of allyl alcohol and vinyl-aromatic compounds; the resulting copolymers; and their use for preparing ester materials. 844,406.

Farbenfabriken Bayer A.G. Polyurethane plastics. 843,841.

Phillips Petroleum Co. Blends of silicone rubber and crystalline ethylene polymer and method for production thereof. 843,665.

National Research Development Corporation. Polymers of fluorinated organic compounds. 843,795.

Farbenfabriken Bayer A.G. Polyurethane plastics. 843,796.

Imperial Chemical Industries Ltd. Plasticized vinyl chloride resins. 844,310.

Vereinigte Glanzstoff-Fabriken A.G. Process for the production of polyamides having modified terminal groups. 844,479.

Union Carbide Corporation. Epoxy alcohol and ethers or esters thereof. 844,312.

London Rubber Co. Ltd. Formation of beads on the edges of rubber articles produced by dipping. 843,798.

Farbenfabriken Bayer A.G. Process for the production of copolymers of ethylene. 843,974.

Imperial Chemical Industries Ltd. Rigid thermoplastic moulding compositions. 844,315.

Farbenfabriken Bayer A.G. Process for the production of filamentary materials from polycarbonates. 844,488.

Imperial Chemical Industries Ltd. Thermoplastic moulding compositions. 844,325.

Dow Chemical Co. Method for cross-linking polymers of hydrocarbon olefines. 844,231.

Badische Anilin- & Soda-Fabrik A.G. Dyeing textile materials of natural or regenerated cellulose. 843,720.

Adhesive Tapes Ltd. Adhesive tape. 844,331.

British Oxygen Research & Development Ltd. Method of separating rubber or rubber-like material from metal. 844,500.

Onderzoekingsinstituut Research N.V. Preparation of macromolecular polycarbonates. 843,881.

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